

# **HITACHI**

**Home Electronics Division**

**2003**

**Auto Digital  
Convergence  
Pocket Manual**

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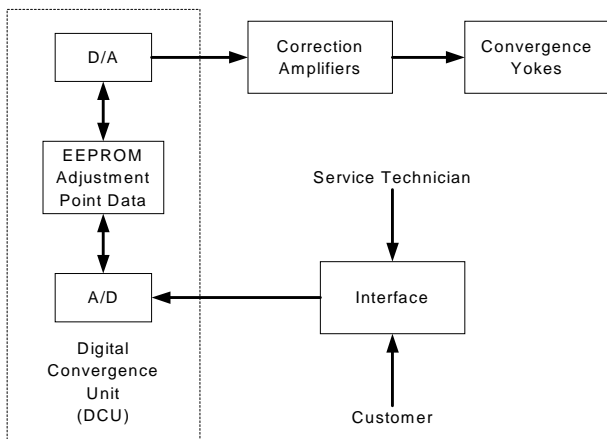
# INTRODUCTION

## *Getting Started with Digital Convergence*

This handbook is designed to provide a simplified, step-by-step approach towards understanding the principles, troubleshooting, and adjusting of the Hitachi Digital Convergence System. The handbook covers, in detail, the convergence procedures for all Hitachi Projection Televisions using the Digital Convergence System, including the newer 2H models. Some of these new models require the technician to perform the convergence adjustments in two completely separate modes, due to the TV having two separate horizontal scanning frequencies.

## *Digital Convergence Correction - History*

Since 1991, Hitachi has manufactured Projection Television products that use data stored in an EEPROM as convergence correction data. The correction data is converted to analog parabolic and sawtooth waveforms and sent to the respective output devices. The first Hitachi model to use this system was the 60SX1B/K.



The Digital Convergence adjustment process began by shorting two internal test points to set the unit to the Digital Convergence Adjustment Mode (DCAM). From the DCAM, or service mode, the necessary adjustments were made to correct the convergence errors.

# INTRODUCTION

The remote control was used to adjust the position of an internally generated crosshatch pattern for each CRT. *While in the DCAM/service mode, a number of buttons on the remote control are allocated specifically for convergence adjustments, and no longer operate the functions indicated on their button.*

Adjustments of the crosshatch pattern must be matched to a precision reference overlay attached to the front of the screen. **The reference overlay is considered to be a necessary service jig.** The lines printed on the overlay are used as a reference for setting up the Green CRT convergence. Once the Green CRT has been completed, the Red and Blue can then be converged using Green as the reference.

When the convergence adjustments have been completed, the Digital Convergence adjustment data is stored in the EEPROM. The data is then converted to analog R(V), R(H), G(V), G(H), B(V), B(H) correction waveforms and applied to the output convergence drivers and amplifiers for each CRT's convergence yoke.

## ***Digital Convergence Correction - Present***

Since the 60SX1B/K, significant improvements have been made to the Digital Convergence System. The customer can now push a single button to automatically readjust the convergence in case of convergence drift caused by the position of the set relative to the earth's magnetic field.

The new Automatic Digital Convergence feature is called "**MAGIC FOCUS**", and provides both static and dynamic convergence correction with superior results.

## ***Magic Focus***

Automatic Digital Convergence (Magic Focus), normally uses eight light sensors located on the inner side of the screen frame perimeter. During the Magic Focus procedure, light patterns are internally generated and read by the sensors. The results are transferred to the Digital Convergence Unit (DCU), and are used to calculate the correction required to return the product to the original 'memorized' convergence parameters.

# INTRODUCTION

Set-up for the Automatic Digital Convergence System uses the same service principles as the non-Automatic Digital Convergence System:

- 1) *Initiate the service mode (DCAM)*
- 2) *Make convergence corrections with remote control*
- 3) *Store the updated correction data in the EEPROM*
- 4) *Initialize the Magic Focus sensor data positions*
- 5) *Exit the service mode*

The primary difference between the Automatic (Magic Focus) and non-Automatic (non-Magic Focus) Digital Convergence procedures is that there is an additional step required to ensure that the Magic Focus feature will operate correctly. This step uses the sensors and pattern data together to calculate the convergence correction data for storage in the EEPROM as permanent reference data for Magic Focus. ***If this step is bypassed, the Magic Focus feature will not operate***, although the convergence correction procedures will have been properly set up.

## Conclusion

Included in this handbook is all the information required to perform the Automatic Digital Convergence correction adjustments in the customer's home. The flowcharts, troubleshooting, and adjusting procedures are specifically designed for in-home use.

# EQUIPMENT REQUIREMENTS

The following equipment and jigs are extremely important for completing the precise convergence adjustments required for the Automatic Digital Convergence System. If the DCU (Digital Convergence Unit) is replaced, a complete alignment is necessary. This includes the usage of the screen overlay or jig.

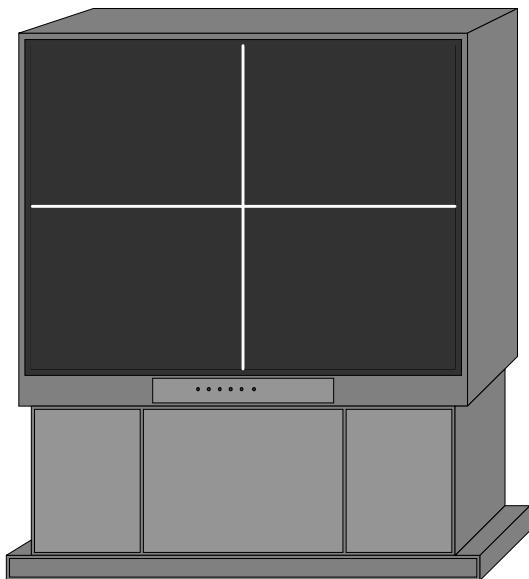
## WARNING

*If the screen overlay is not used during the setup procedure of the green crosshatch, noticeable linearity problems will occur, as well as probable error code generation during the Magic Focus sensor data initialization process.*

## NTSC GENERATOR

The external NTSC generator must be capable of providing a single cross NTSC pattern. This is used to establish the magnetic centering for each CRT.

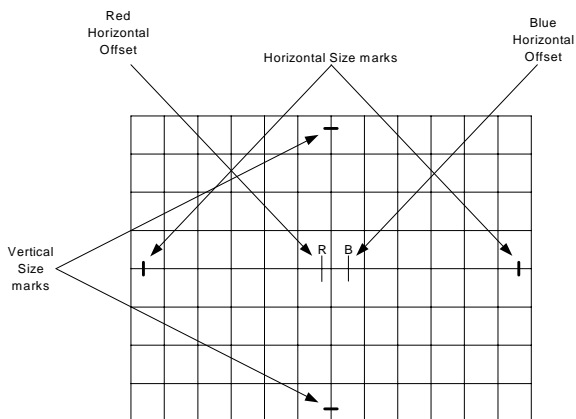
### Single Cross Signal



# SCREEN OVERLAY

## SCREEN OVERLAY (JIG)

Required for convergence alignments. See page 6 for installation procedure.

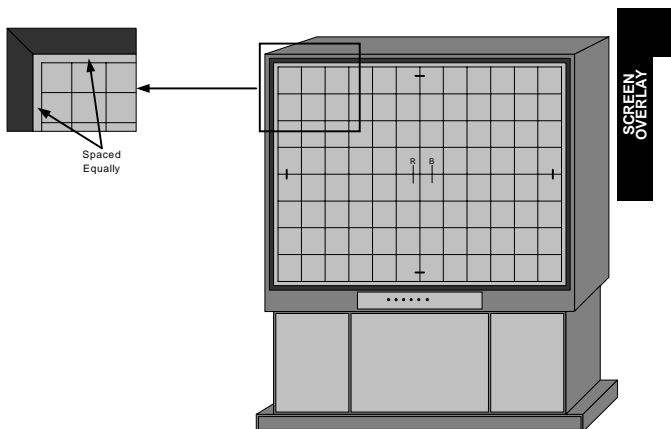


Shown above is an example of the screen overlay (jig).

# SCREEN OVERLAY

## SCREEN OVERLAY INSTALLATION

*Must be used during a complete alignment*



Place the transparent Screen Overlay ***geometrically*** on the PTV screen, making sure the outside lines on the overlay are an equal distance from the inside edges of the frame on all four sides.



# CHASSIS/MODEL CROSS REFERENCE

*Including Remotes and Overlay part numbers*

## 1H MODELS

CROSS  
REFERENCE

CHASSIS	MODEL	REMOTE	OVERLAY
AP53	46UX20B	CLU-951MP	H310353
	46UX21K	CLU-951MP	H310353
	50UX22B	CLU-951MP	H310354
	50UX23K	CLU-951MP	H310354
AP53D	60SX10B	CLU-951MP	H310355
	60SX11K	CLU-951MP	H310355
AP53DP	60SX10BA	CLU-951MP	H310355
	60SX11KA	CLU-951MP	H310355
AP53P	46UX20BA	CLU-951MP	H310353
	46UX21KA	CLU-951MP	H310353
	50UX22BA	CLU-951MP	H310354
	50UX23KA	CLU-951MP	H310354
AP62	50FX18B	CLU-417UI	H310354
	50FX19K	CLU-417UI	H310354
	50FX30B	CLU-434VP	H310354
	55FX20B	CLU-417UI	H310356
	60FX32B	CLU-951MP	H310355
AP62P	50FX48B	CLU-417UI	H310354
AP63	46UX24B	CLU-952MP	H310353
	46UX25K	CLU-952MP	H310353
	50UX26B	CLU-952MP	H310354
	50UX27K	CLU-952MP	H310354
AP63B	60SX12B	CLU-952MP	H310355
	60SX13K	CLU-952MP	H310355
AP73	46UX50B	CLU-612MP	H310353
	46UX51K	CLU-612MP	H310353
	50UX52B	CLU-612MP	H310354
	50UX53K	CLU-612MP	H310354
	60UX54B	CLU-612MP	H310355
	60UX55K	CLU-612MP	H310355
AP74	50SBX70B	CLU-612MP	H310354
	60SBX72B	CLU-612MP	H310355
	70SBX74B	CLU-612MP	H310357

# CHASSIS/MODEL CROSS REFERENCE

*Including Remotes and Overlay part numbers*

1H MODELS			
CHASSIS	MODEL	REMOTE	OVERLAY
AP82	55FX48B	CLU-431UI	H310356
AP83	50UX58B/K	CLU-612MP	H310354
	55UX58BA	CLU-612MP	H310356
	60UX58B/K	CLU-612MP	H310355
AP83P	55UX58B	CLU-612MP	H310356
AP83R	50UX57B	CLU-615MP	H310354
	60UX57B	CLU-615MP	H310355
AP84	50SBX78B	CLU-613MP	H310354
	60SBX78B	CLU-613MP	H310355
AP92	50GX49B	CLU-435U	H310354
AP92R	46FX01B	CLU-436UI	H310353
	46GX01B	CLU-436UI	H310353
	50GX10B	CLU-436UI	H310354
	50GX20B	CLU-436UI	H310354
AP92R/S	50GX10BA	CLU-436UI	H310354
	50GX20BA	CLU-436UI	H310354
	46GX01BA	CLU-436UI	H310353
AP93	53SBX59B	CLU-615MP	H310359
	61SBX59B	CLU-615MP	H310358
AP93R	53SBX01B	CLU-573TSI	H310359
	61SBX01B	CLU-573TSI	H310358
AP02	43GX01B	CLU-573TSI	H312222
HP11	50DX10B	CLU-4311UG	H310354
	50DX20B	CLU-4311UG	H310354
	50FX20B	CLU-4311UG	H310354
	60DX10B	CLU-4311UG	H310355
	60DX20B	CLU-4311UG	H310355
	60FX20B	CLU-4311UG	H310355
HP12	43GX10B	CLU-4311UG	H312222
	50GX30B	CLU-4311UG	H310354
	50GX30BA	CLU-4311UG	H310354
HP13	53SBX10B	CLU-5714TSI	H310359

CROSS  
REFERENCE

# CHASSIS/MODEL CROSS REFERENCE

*Including Remotes and Overlay part numbers*

CROSS  
REFERENCE

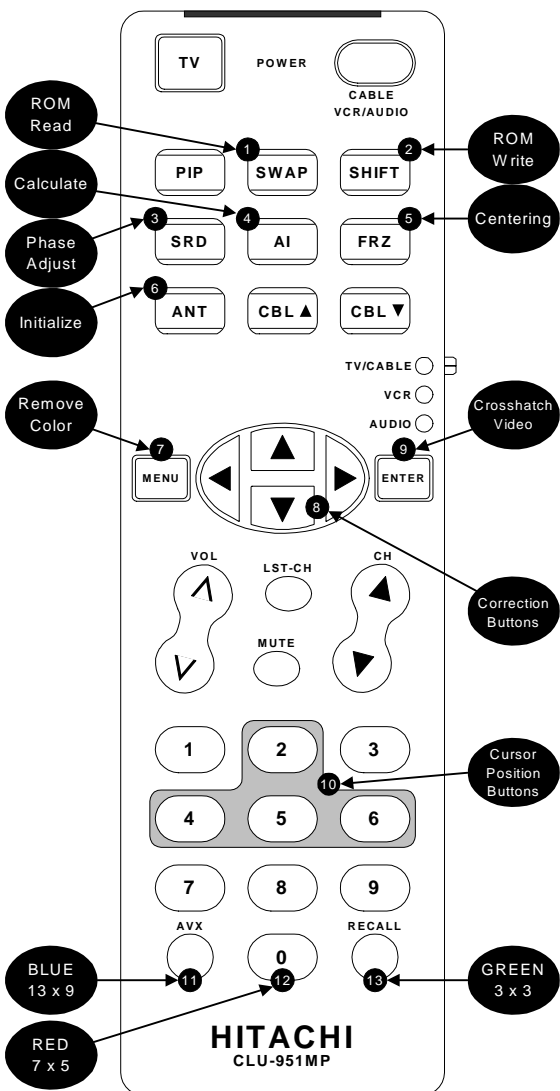
2H MODELS				
CHASSIS	MODEL	REMOTE	OVERLAY 1	OVERLAY 2
DP85	61HDX98B	CLU-614MP	H312182A	H312183A
DP86	53SDX89B	CLU-615MP	H310359	H312184
	60SDX88B	CLU-612MP	H310355	H312181A
DP86V	53SDX89BA	CLU-615MP	H310359	H312184
	60SDX88BA	CLU-615MP	H310355	H312181A
DP05	53FDX01B	CLU-575TSI	H312223	H312224
DP05F	43FDX01B	CLU-575TSI	H312225	H312226
DP06	53SDX01B	CLU-572TSI	H312223	H312224
	61SDX01B	CLU-572TSI	H310355	H312181A
DP07	53SWX01W	CLU-575TSI	H312241	H312242
	61SWX01W	CLU-575TSI	H312243	H312244
DP14G	43UWX10B	CLU-5713TSI	H312259	
	53UWX10B	CLU-5711TSI	H312257	
	53UWX10BA	CLU-5711TSI	H312257	
	61UWX10B	CLU-5711TSI	H312258	
	61UWX10BA	CLU-5711TSI	H312258	
DP15	53UDX10B	CLU-5713TSI	H312253	H312254
	53UDX10BA	CLU-5713TSI	H312253	H312254
	61UDX10B	CLU-5713TSI	H312255	H312256
DP15E	43FDX10B	CLU-5713TSI	H312251	H312252
	43FDX11B	CLU-5713TSI	H312251	H312252
DP15H	53FDX20B	CLU-4322UG	H312253	H312254
DP15K	43FDX15B	CLU-4322UG	H312251	H312252
	43FDX20B	CLU-4322UG	H312251	H312252
DP17	53SWX10B	CLU-5713TSI	H312257	
	53SWX12B	CLU-5713TSI	H312257	
	61SWX10B	CLU-5713TSI	H312258	
	61SWX12B	CLU-5713TSI	H312258	
DP23	51UWX20B	CLU-4321UG	H312272	
	57UWX20B	CLU-4321UG	H312273	
	51/57F500	CLU-4321UG	H312273	
	51/57G500	CLU-4321UG	H312273	
DP23G	51GWX20B	CLU-4321UG	H312272	
	57GWX20B	CLU-4321UG	H312273	
DP23K	46F500	CLU-4321UG	H312275	
DP24	43FWX20B	CLU-4321UG	H312271	
DP26	57XWX20B	CLU-5721TSI	H312273	
	65XWX20B	CLU-5721TSI	H312274	
DP27	51SWX20B	CLU-5722TSI	H312272	
	57SWX20B	CLU-5722TSI	H312273	
	65SWX20B	CLU-5722TSI	H312274	
DP27D	57TWX20B	CLU-5722TSI	H312273	
	65TWX20B	CLU-5722TSI	H312274	

# REMOTE CONFIGURATIONS

<b>Remote</b>	<b>Page</b>
CLU-951MP	11
CLU-952MP	13
CLU-417UI	15
CLU-431UI	17
CLU-434VP	19
CLU-435U	21
CLU-436UI	23
CLU-612MP	25
CLU-613MP	27
CLU-614MP	29
CLU-615MP	31
CLU-617MP	33
CLU-572TSI	35
CLU-573TSI	37
CLU-575TSI	39
CLU-5711TSI	41
CLU-5712TSI	43
CLU-5713TSI	45
CLU-5714TSI	47
CLU-5721TSI	49
CLU-5722TSI	51
CLU-4311UG	53
CLU-4321UG	55
CLU-4322UG	57

# REMOTE CONFIGURATIONS CLU-951MP

## REMOTES



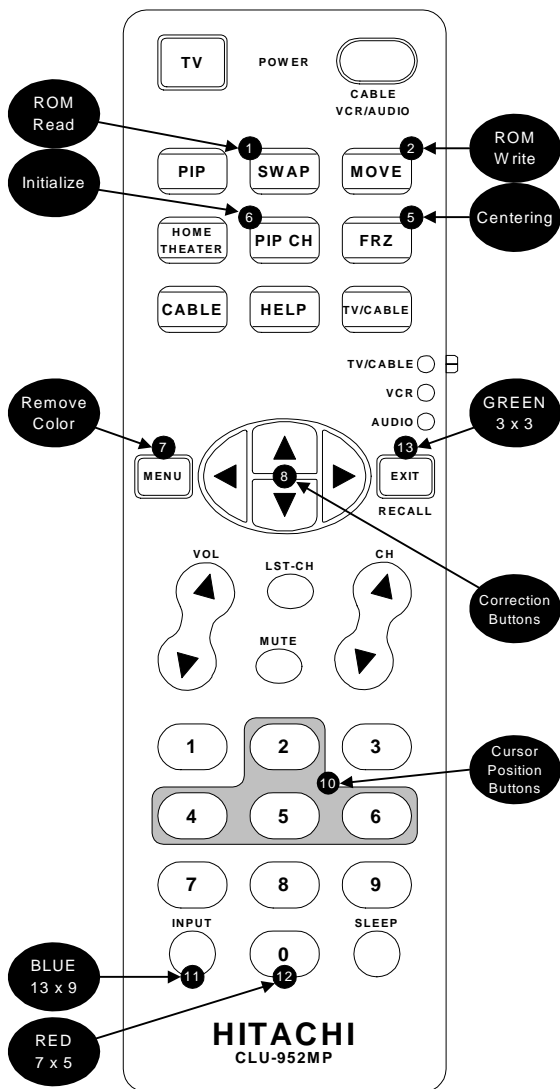
# REMOTE CONFIGURATIONS CLU-951MP

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS SHIFT, ANT**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **AVX, 0, and RE-CALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-952MP

## REMOTES



# REMOTE CONFIGURATIONS CLU-952MP

## *Button Explanations*

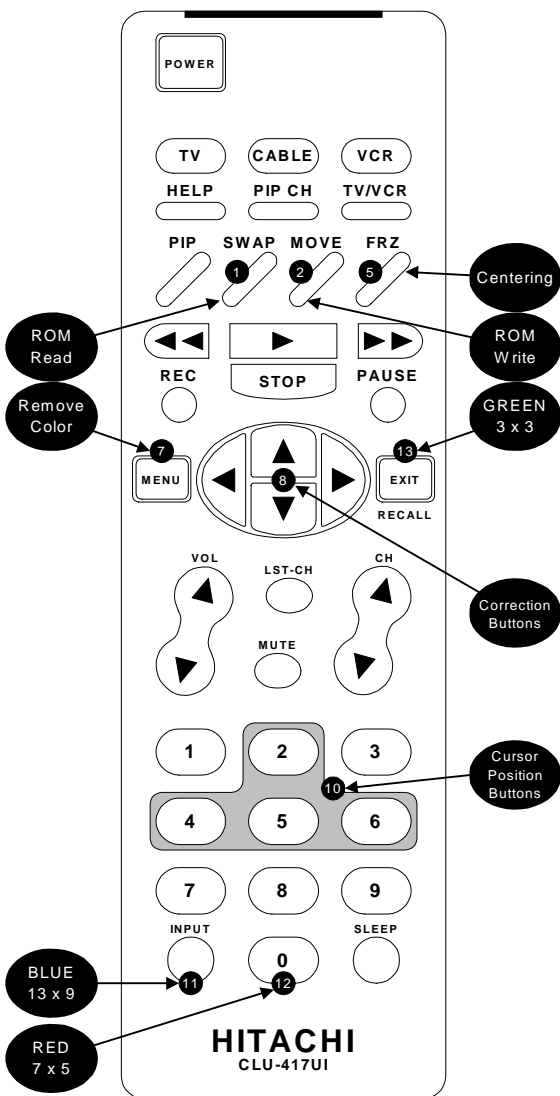
1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Not Available
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RE-CALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - Not Available
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 3, 4, and 9 using this remote.



# REMOTE CONFIGURATIONS CLU-417UI

## REMOTES



# REMOTE CONFIGURATIONS CLU-417UI

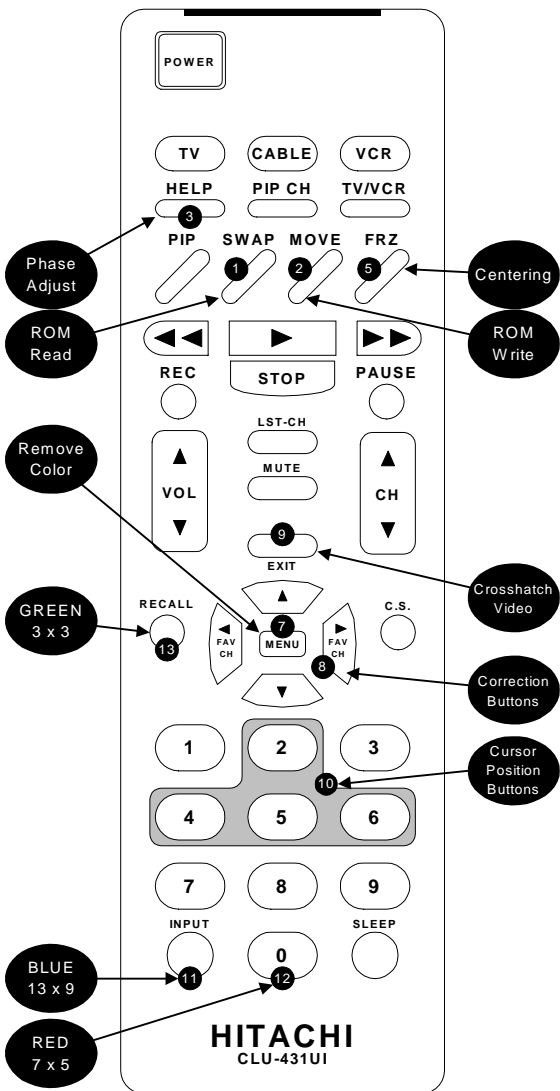
## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Not Available
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Not Available
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - Not Available
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 3, 4, 6, and 9 using this remote.

# REMOTE CONFIGURATIONS CLU-431UI

## REMOTES



# REMOTE CONFIGURATIONS CLU-431UI

## *Button Explanations*

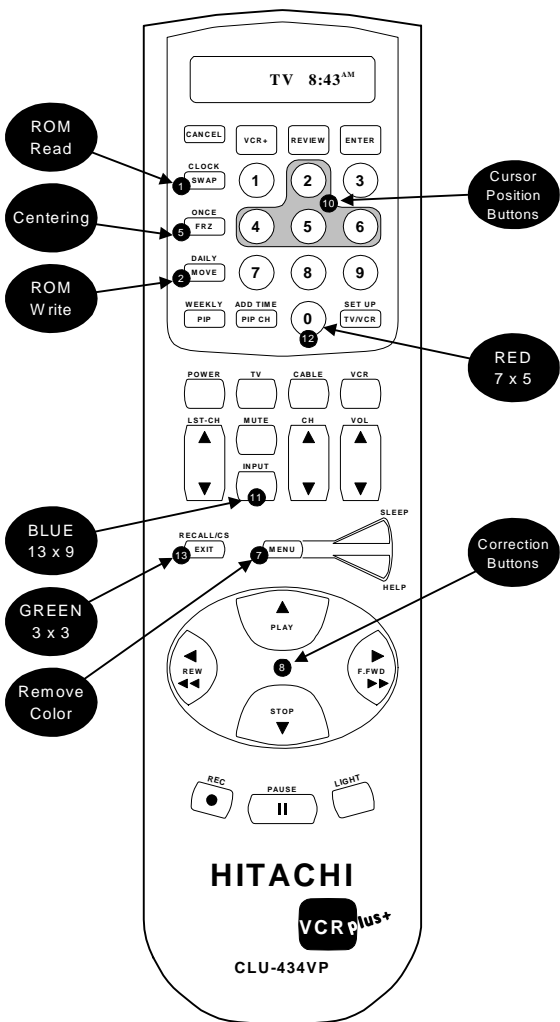
## REMOTES

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Not Available
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 4 and 6 using this remote.

# REMOTE CONFIGURATIONS CLU-434VP

## REMOTES



# REMOTE CONFIGURATIONS CLU-434VP

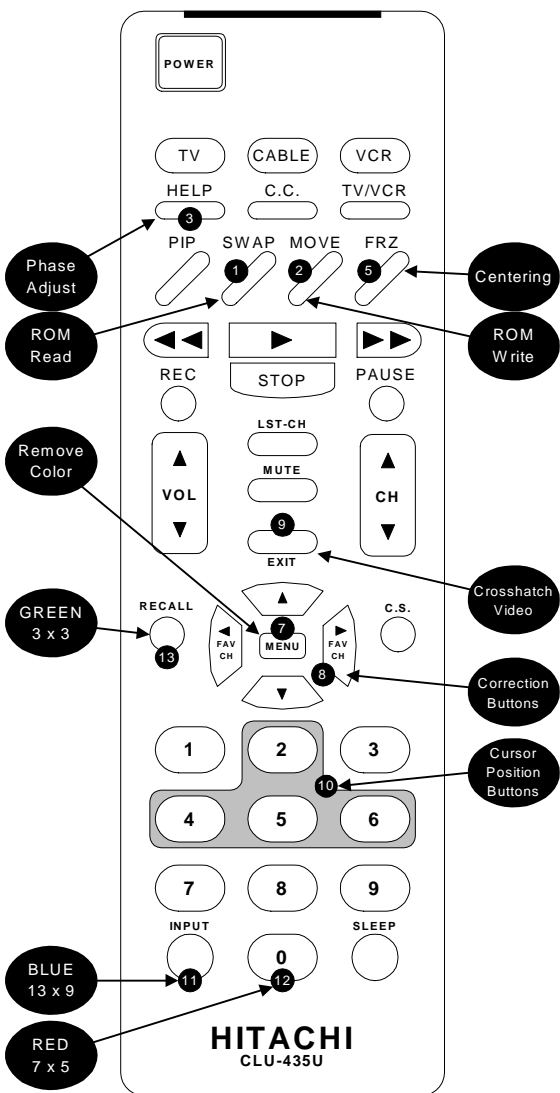
## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Not Available
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Not Available
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - Not Available
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 3, 4, 6, and 9 using this remote.

# REMOTE CONFIGURATIONS CLU-435U

## REMOTES



# REMOTE CONFIGURATIONS CLU-435U

## *Button Explanations*

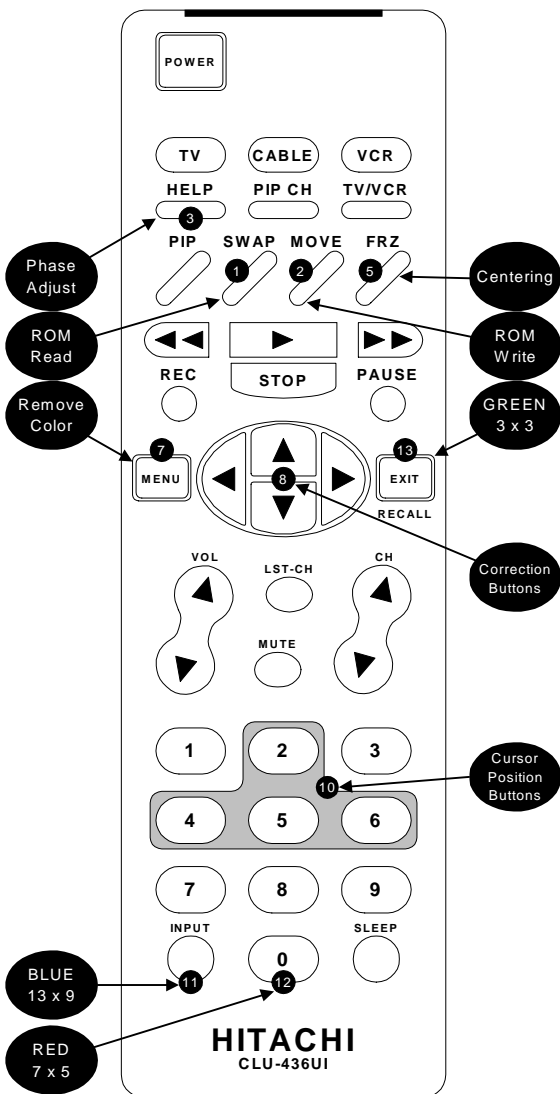
1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Not Available
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 4 and 6 using this remote.



# REMOTE CONFIGURATIONS CLU-436UI

## REMOTES



# REMOTE CONFIGURATIONS CLU-436UI

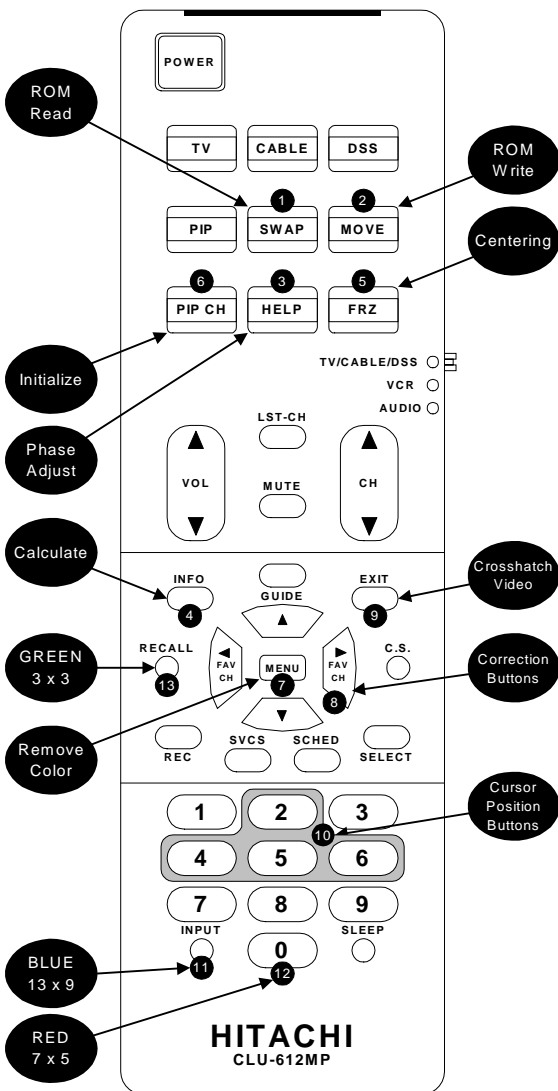
## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Not Available
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - Not Available
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust items 4, 6, and 9 using this remote.

# REMOTE CONFIGURATIONS CLU-612MP

## REMOTES



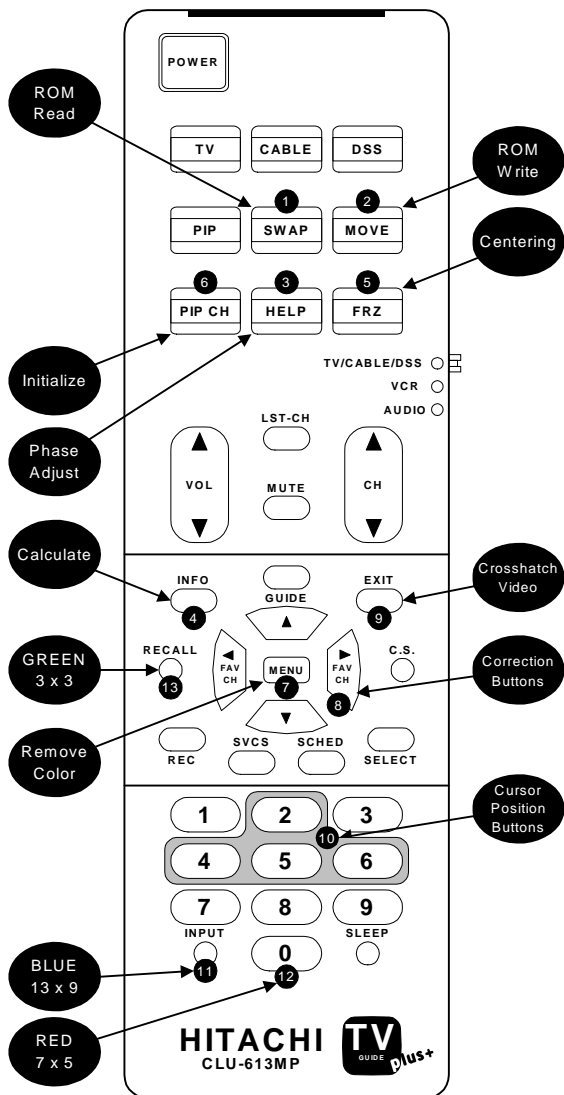
# REMOTE CONFIGURATIONS CLU-612MP

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-613MP

## REMOTES



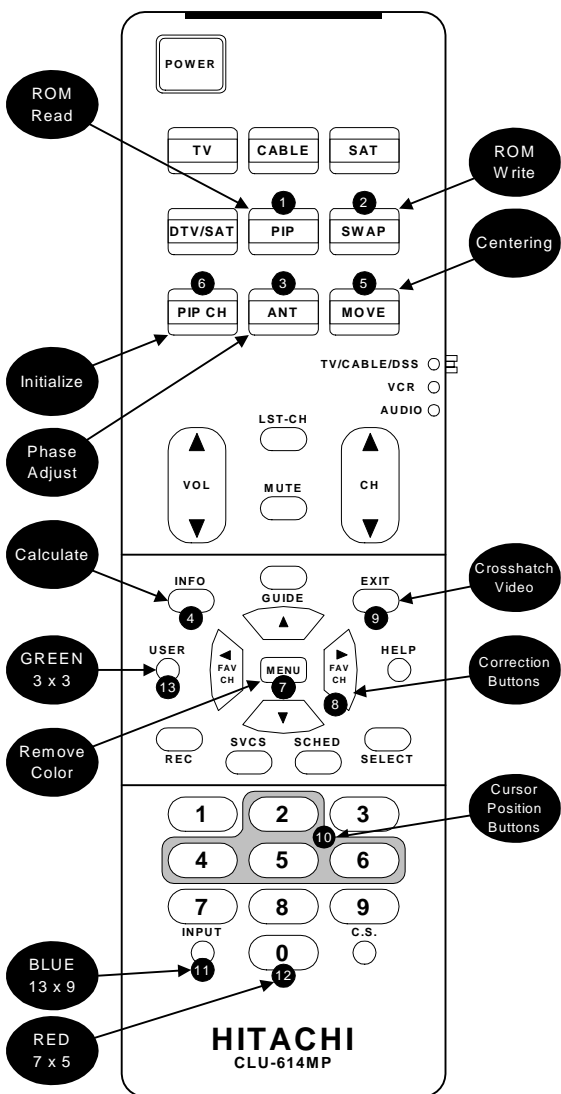
# REMOTE CONFIGURATIONS CLU-613MP

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0,** and **RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-614MP

## REMOTES



# REMOTE CONFIGURATIONS CLU-614MP

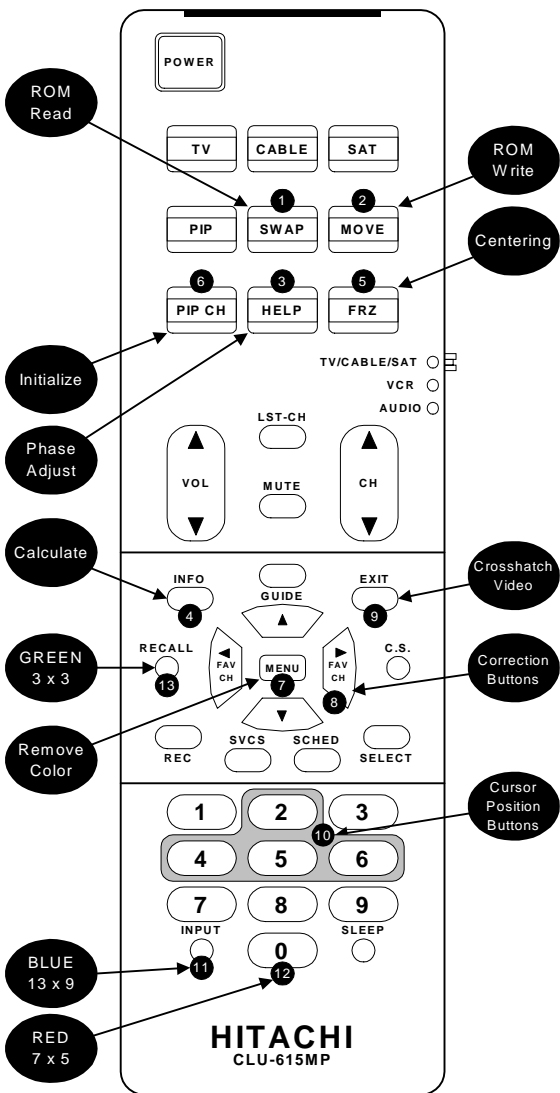
## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS SWAP, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0**, and **USER** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.



# REMOTE CONFIGURATIONS CLU-615MP

## REMOTES



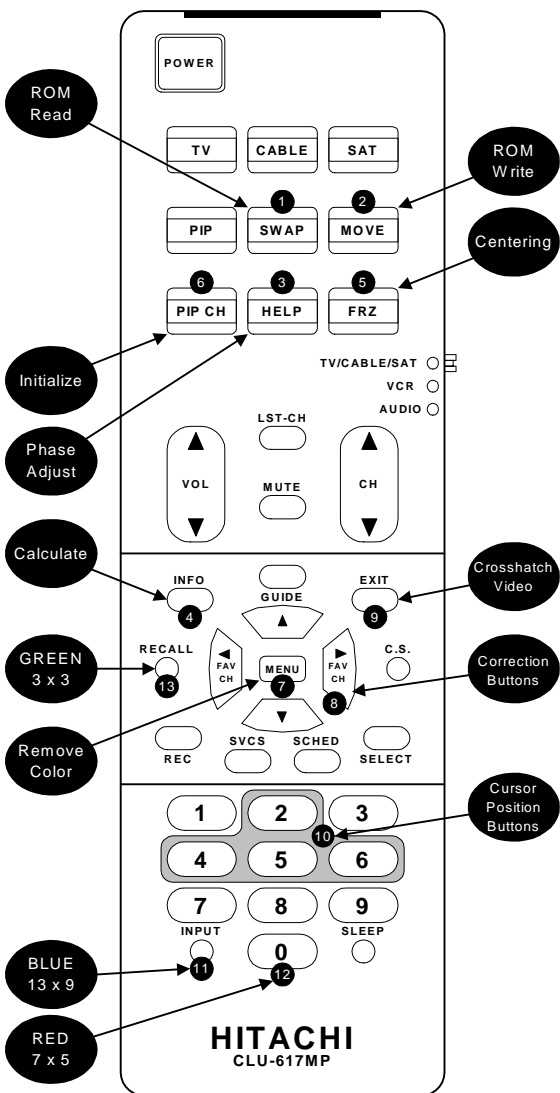
# REMOTE CONFIGURATIONS CLU-615MP

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-617MP

## REMOTES



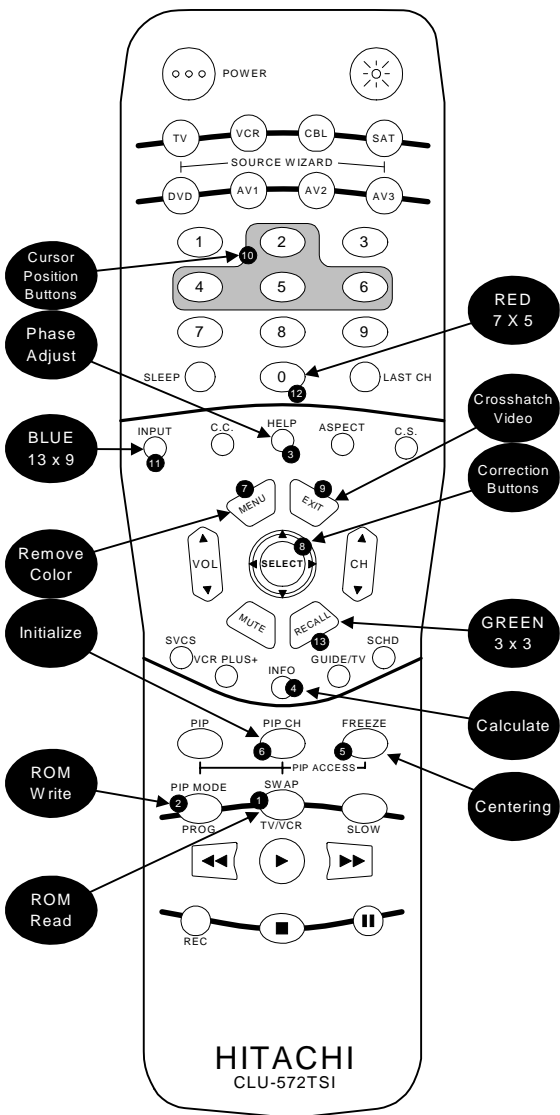
# REMOTE CONFIGURATIONS CLU-617MP

## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-572TSI

## REMOTES



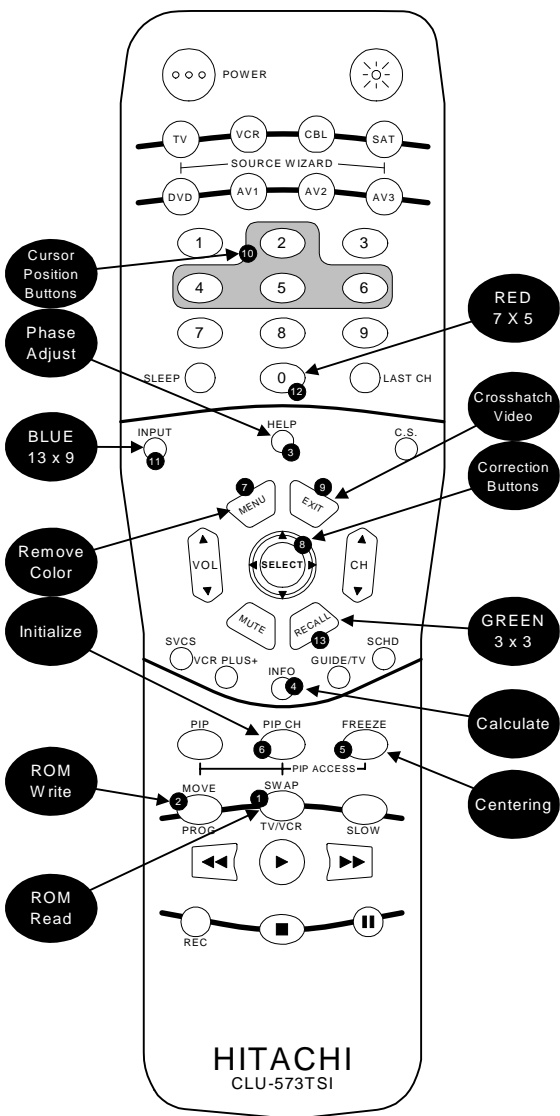
# REMOTE CONFIGURATIONS CLU-572TSI

## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-573TSI

## REMOTES



# REMOTE CONFIGURATIONS CLU-573TSI

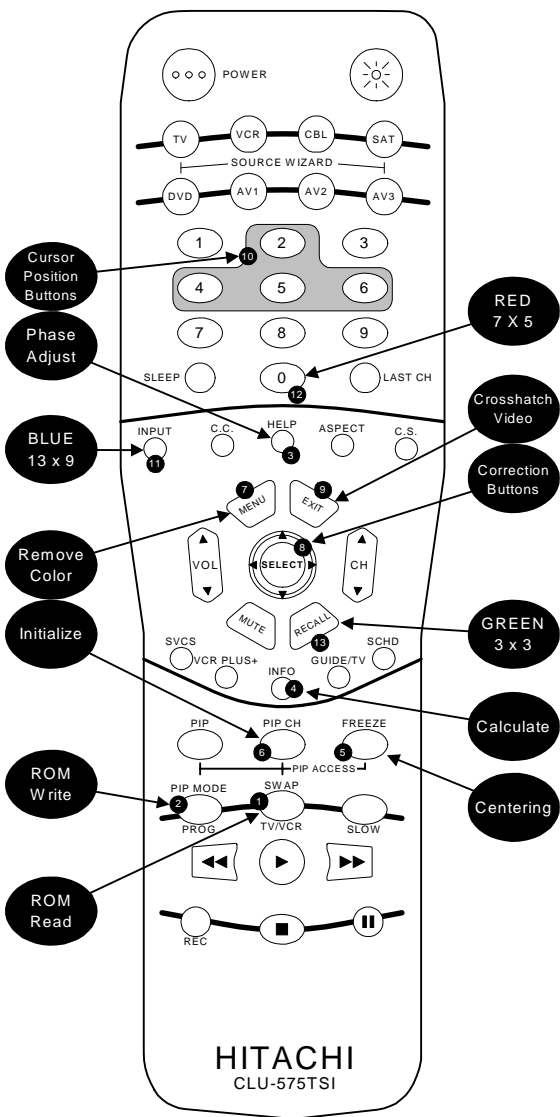
## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.



# REMOTE CONFIGURATIONS CLU-575TSI

## REMOTES



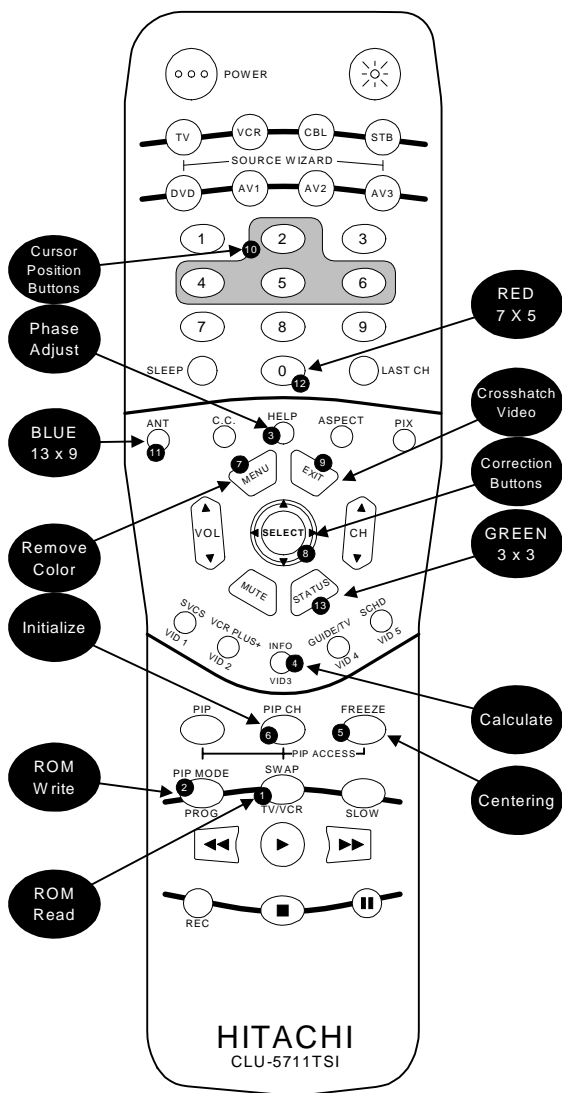
# REMOTE CONFIGURATIONS CLU-575TSI

## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT, 0, and RECALL** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-5711TSI

## REMOTES



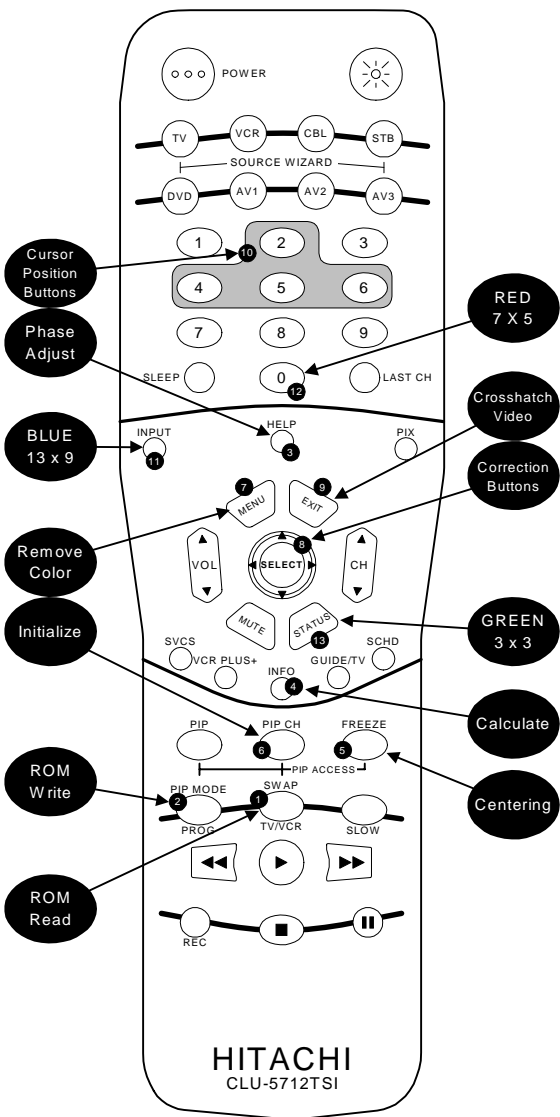
# REMOTE CONFIGURATIONS CLU-5711TSI

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-5712TSI

## REMOTES



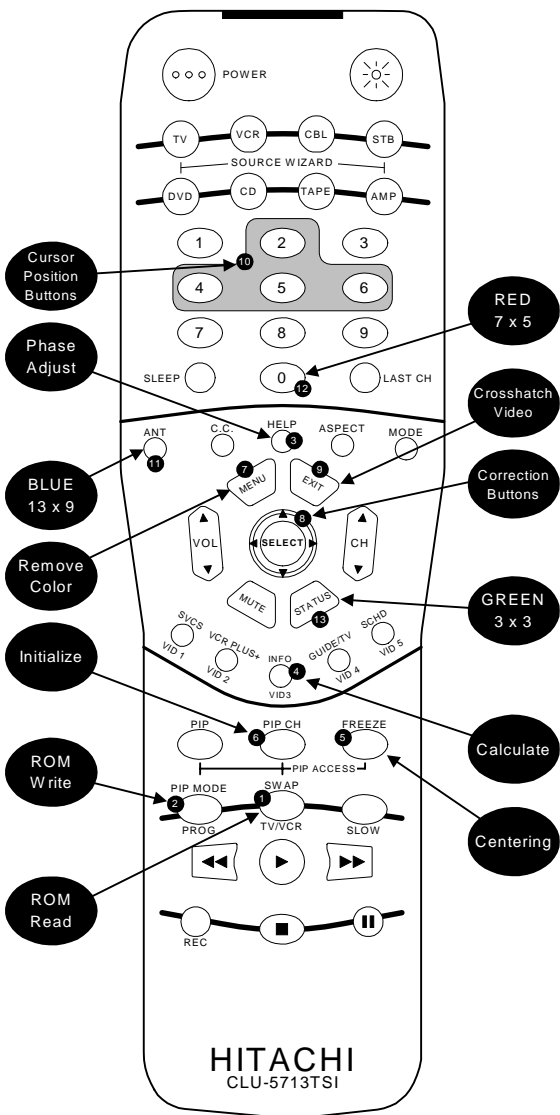
# REMOTE CONFIGURATIONS CLU-5712TSI

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-5713TSI

## REMOTES



# REMOTE CONFIGURATIONS CLU-5713TSI

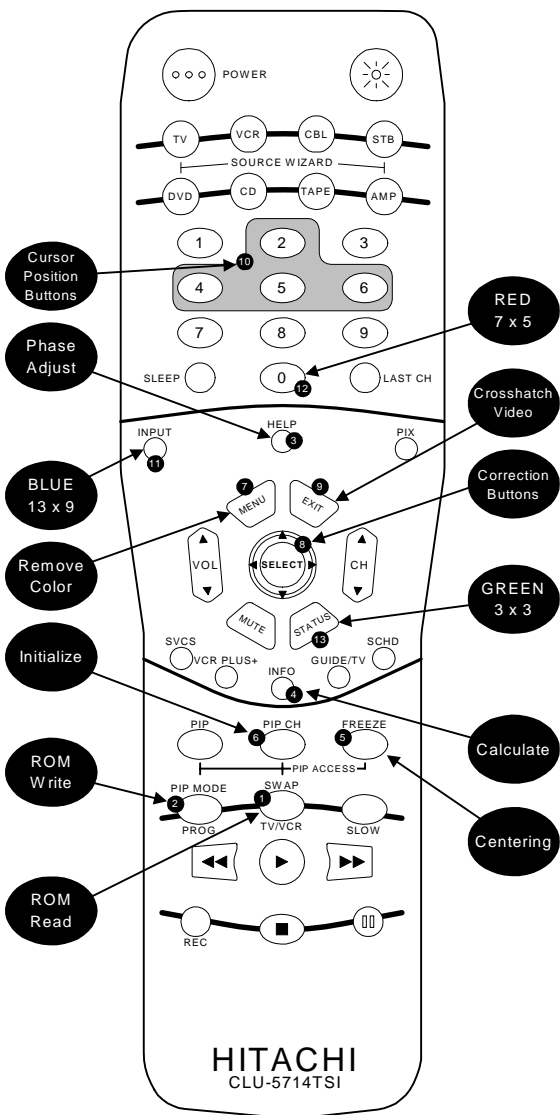
## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.



# REMOTE CONFIGURATIONS CLU-5714TSI

## REMOTES



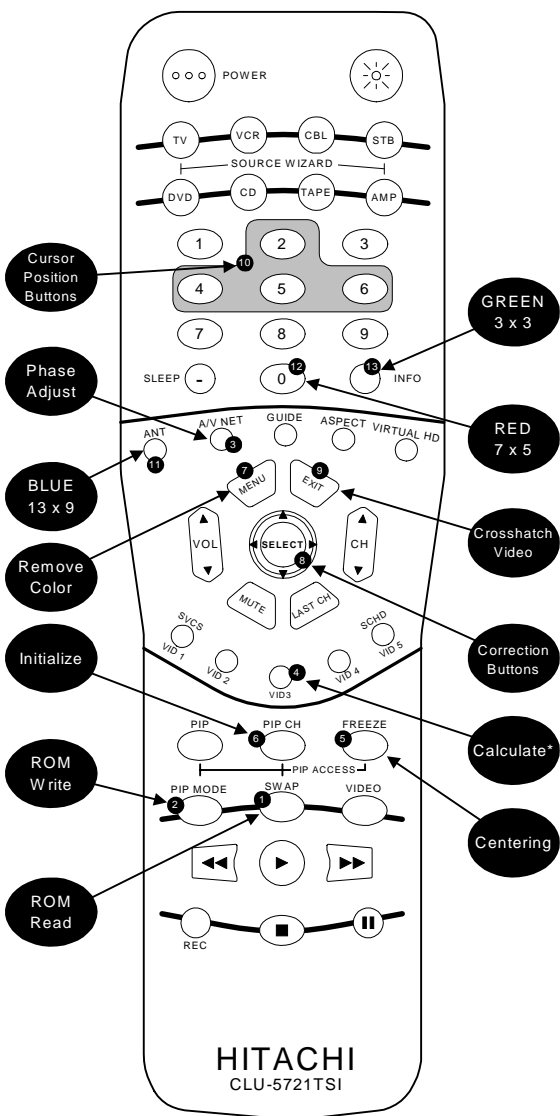
# REMOTE CONFIGURATIONS CLU-5714TSI

## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-5721TSI

## REMOTES



\*Remote must be in VCR Mode

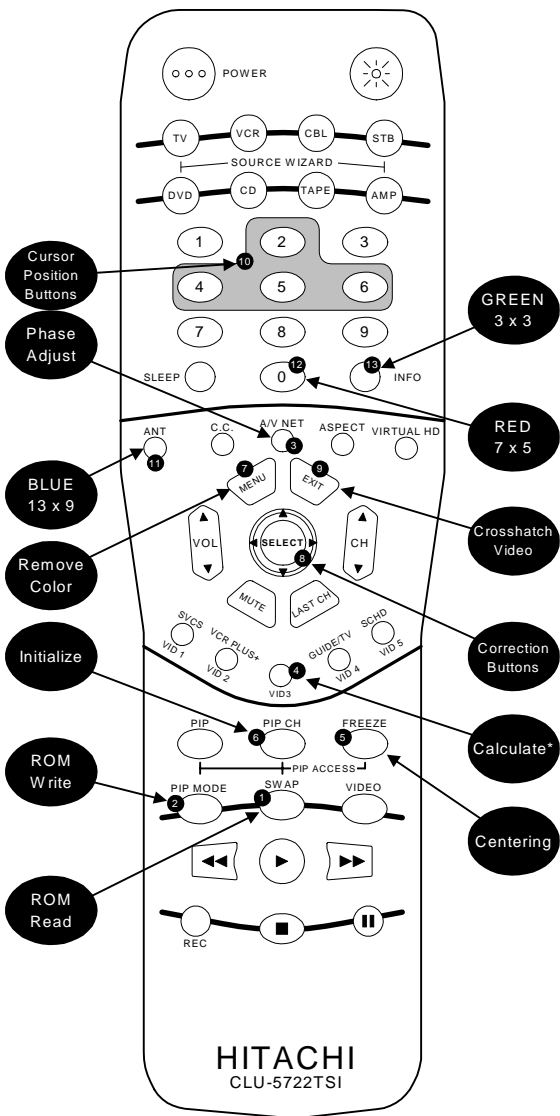
# REMOTE CONFIGURATIONS CLU-5721TSI

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **INFO** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-5722TSI

## REMOTES



\*Remote must be in VCR Mode

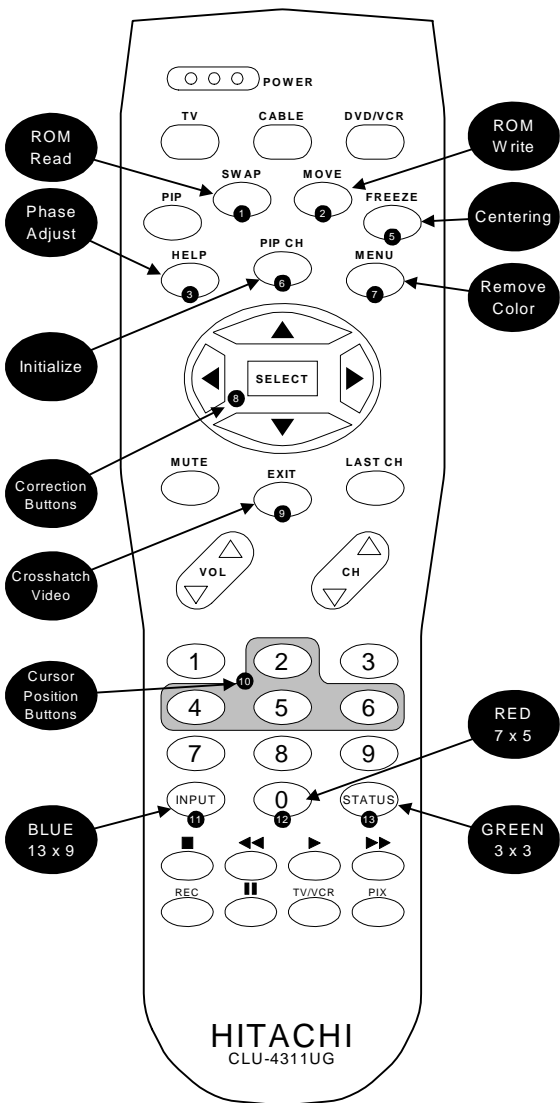
# REMOTE CONFIGURATIONS CLU-5722TSI

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **INFO** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-4311UG

## REMOTES



# REMOTE CONFIGURATIONS CLU-4311UG

## Button Explanations

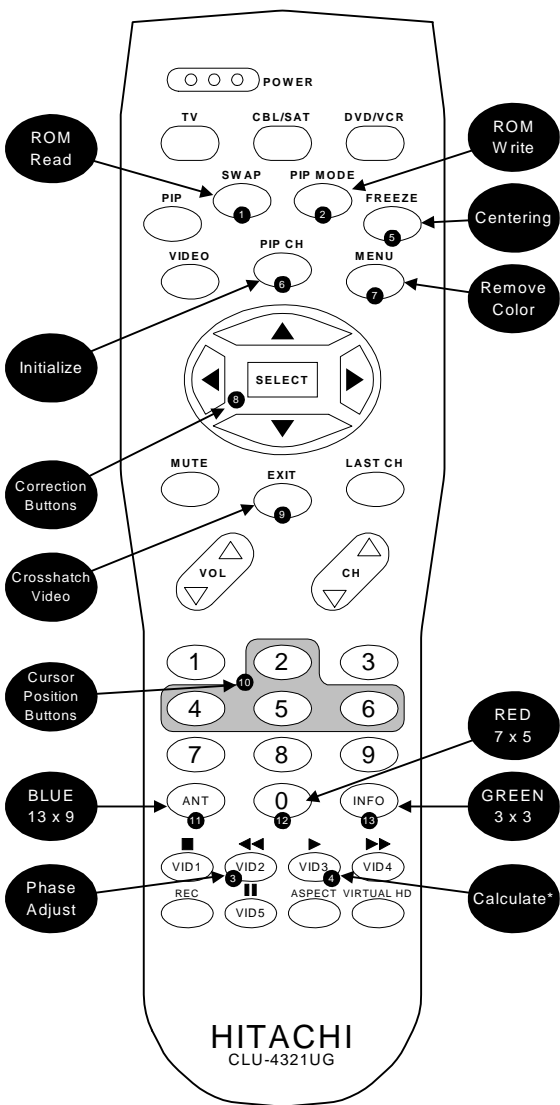
1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS MOVE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **INPUT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust item 4 using this remote.



# REMOTE CONFIGURATIONS CLU-4321UG

## REMOTES



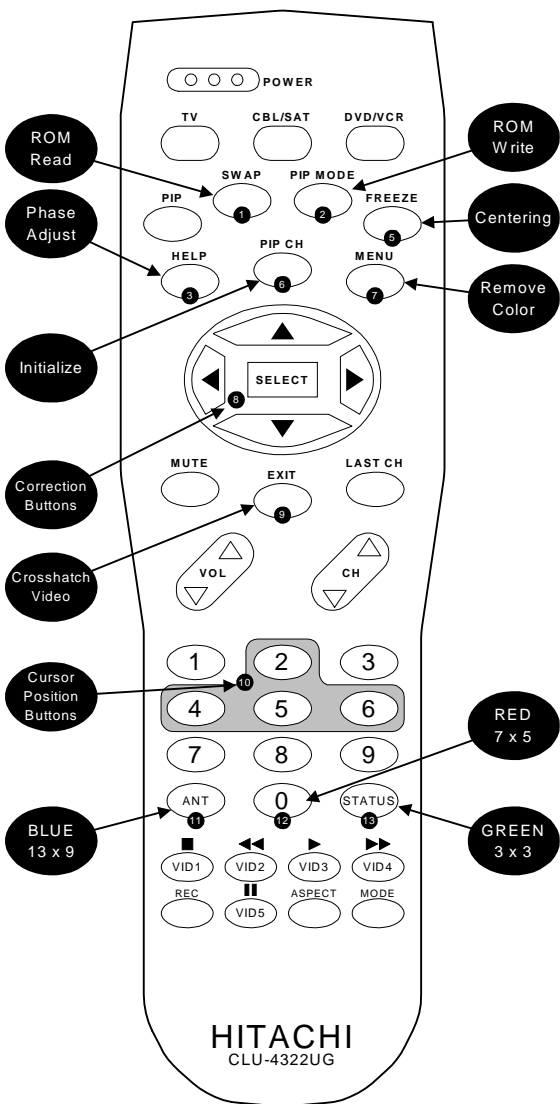
# REMOTE CONFIGURATIONS CLU-4321UG

## *Button Explanations*

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Performs interpolation between adjustment points for a total of 255 data locations.
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **INFO** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

# REMOTE CONFIGURATIONS CLU-4322UG

## REMOTES



# REMOTE CONFIGURATIONS CLU-4322UG

## Button Explanations

1. **Read From ROM** - Reads the stored EEPROM data current working RAM. (**PRESS 2X**)
2. **Write to ROM** - Stores current convergence data in working RAM to the EEPROM (**PRESS 2X**)
3. **Phase Adjust** - Mode used for matching positions of the cursor and adjustment point for matching phase.
4. **Calculate** - Not Available
5. **Centering** - Turns on the static raster centering mode for matching the internal crosshatch to the external video center.
6. **Initialize** - Develops the reference data for Magic Focus using the 8 sensors and light pattern sampling data. (**PRESS PIP MODE, PIP CH**)
7. **Color Display Mode (Remove Color)** - Used to toggle between all colors (white) and either Green only, Red + Green (yellow), or Blue + Green (cyan). Use of this button is in conjunction with the **ANT**, **0**, and **STATUS** buttons.
8. **Correction Buttons** - Used to adjust the horizontal and vertical position of the adjustment point. The blinking crosshatch intersection identifies the selected adjustment point.
9. **Crosshatch/Video Mode** - When pressed five times, this button will toggle between the normal input video and the internally generated convergence crosshatch pattern.
10. **Cursor Position Buttons** - Moves the adjustment point of the internal crosshatch pattern line intersections. (2 = up, 4 = left, 5 = down, 6 = right)
11. **Blue / 13 x 9** - When used with the **MENU** button, will display green and blue. When pressed 5 times, will enable 13 x 9 mode.
12. **Red / 7 x 5** - When used with the **MENU** button, will display green and red. When pressed 5 times, will enable 7 x 5 mode.
13. **Green Only / 3 x 3** - When used with the **MENU** button, will display green only. When pressed 5 times, will enable 3 x 3 mode, if RAM was cleared.

Note: It is not possible to adjust item 4 using this remote.

# SERVICE SOLUTIONS

## Maintenance Performed

### STK Replacement

Go to Magic Focus Operation

### CRT Replacement

Go to Complete Convergence Procedure

*Need to set Magnetic Centering*

*(After centering adjust, go to Magic Focus)*

### Deflection PWB Replacement

Go to Complete Convergence Procedure

*Need to set H / V size and position*

*(Re-use original DCU, if possible)*

### DCU Replacement

Go to Complete Convergence Procedure

*Need to create new ROM data*

# SERVICE SOLUTIONS

## First Time Convergence Assessment

Perform Magic Focus Operation (page 61)

## Touch-up Convergence Procedure

Green needs adjustment (page 62)

Red needs adjustment (page 63)

Blue needs adjustment (page 67)

Write to ROM (page 71)

Initialize Sensors (page 72)

## Complete Convergence Procedure

Clear RAM (page 74)

Magnetic Centering (page 75)

Horizontal and Vertical Size Adjustment (page 77)

Static Centering (page 78)

Phase Adjustment (page 79)

Green 3 x 3 Mode (page 81)

Green 7 x 5 Mode (page 83)

Green 13 x 9 Mode (page 85)

Red/Blue 3 x 3 Mode (page 87)

Red/Blue 7 x 5 Mode (page 89)

Red/Blue 13 x 9 Mode (page 91)

Write to ROM (page 93)

Initialize Sensors (page 94)

**DCU Error Codes** (page 95)

## Special Procedures for 2H Models

DP-85 (page 97)

DP-86 (page 99)

DP-0x (page 100)

DP-14G (page 103)

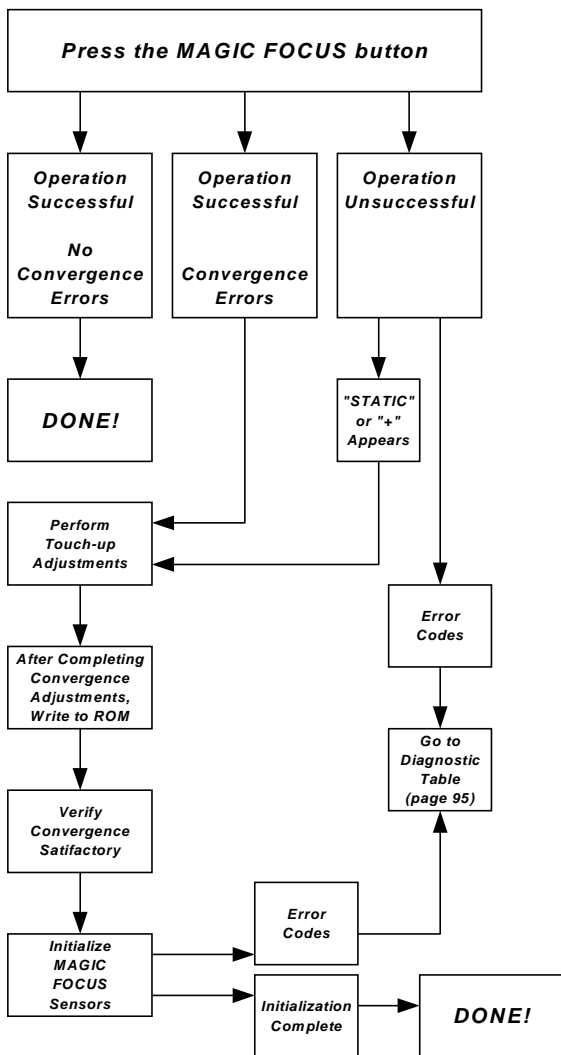
DP-15 (all) (page 109)

DP-17 (page 121)

DP-23/23G/23K/24 (page 127)

DP-26/27/27D (page 133)

# MAGIC FOCUS OPERATION



# TOUCH-UP ALIGNMENT

## Green Needs Adjustment

Like Analog convergence, the green is used as the reference color. Green should be touched up *only* if it's out and both red and blue are aligned with each other. Otherwise, there's no way to know if the reference is out or the other two colors are out. (it could happen) When green needs alignment, the overlay should be used to check the reference.

Proceed to the **Green 13 x 9 Mode** (*page 85*) portion of the complete convergence procedure.

When completed with green touch-up AND the entire crosshatch display is converged, proceed to **Write to ROM** (*page 71*) and **Initialize Sensors** (*page 72*).

TOUCH-UP  
ALIGNMENT





# TOUCH-UP ALIGNMENT - RED

**1. ENTER DCAM** (Digital Convergence Adjustment Mode) Default is 13 x 9 Mode.

**AP-5x/AP-6x:** Press service switch behind hole on front panel for all AP-5x and AP-6x chassis. (*Figure 1*)

**All Other Chassis:** Press service switch on the Deflection PWB. (*Figure 2*) or, for models built after 2000, to access the DCAM without removing the front panel;

Procedure for Chassis DP14G, DP15, DP17:

- 1) Press the **MAGIC FOCUS** button on front panel.
- 2) While Magic Focus is running, press **MAGIC FOCUS** button again to "stop".
- 3) When "STOP" is displayed in OSD, press **RECALL** or **STATUS** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP23/23G, DP24, DP26, DP27:

- 1) Press the **MAGIC FOCUS** button on front panel.
- 2) While Magic Focus is running, press **MAGIC FOCUS** button again to "stop".
- 3) When "STOP" is displayed in OSD, press **INFO** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP06, DP07, HP13:

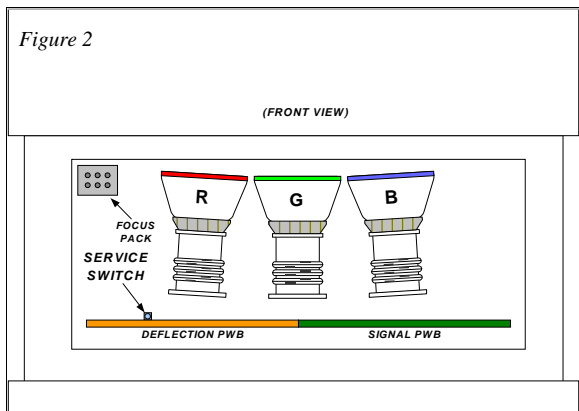
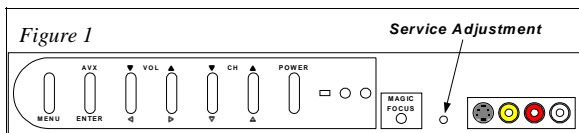
- 1) Press and hold the **MAGIC FOCUS** button on front panel.
- 2) While the button is held down, the OSD will change from "MAGIC FOCUS" to "CENTER MODE", then to "STATIC MODE".
- 3) When "STATIC MODE" is displayed in OSD, press **INPUT** or **ANT** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP05F, DP05, HP11, HP12:

- 1) Press and hold the **DIGITAL ARRAY** or **CONVERGENCE ADJUST** button on front panel.
- 2) While the button is held down, then press the **INPUT** or **ANT** button on remote control.
- 3) The unit will now be in the DCAM.

(continued)

# TOUCH-UP ALIGNMENT - RED



TOUCH-UP  
ALIGNMENT

## 2. SELECT COLOR TO BE ADJUSTED (RED)

Press the button on the remote associated with **Color Display Mode (Remove Color)** , then press the button on the remote associated with **Red / 7 x 5**.

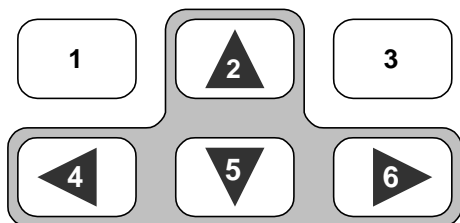
example: **MENU, 0**

Display should now be Red and Green crosshatch lines only. If it is all three colors, press the **MENU** button again to toggle from all colors back to Red and Green only.

(continued)

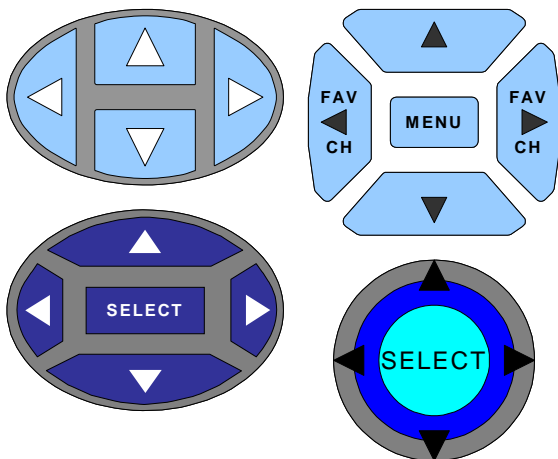
## TOUCH-UP ALIGNMENT - RED

3. Use the **Cursor Position Buttons** to navigate from a selected adjustment point to another adjustment point. The blinking or dashed lines of the crosshatch intersection identifies the selected adjustment point.



TOUCH-UP  
ALIGNMENT

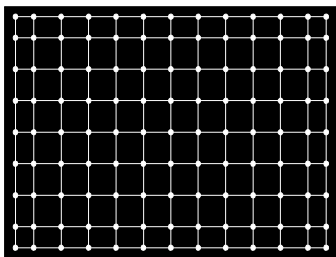
4. Press the **Cursor Adjustment Buttons** at the selected adjustment points to align the red H / V lines with the green H / V lines.



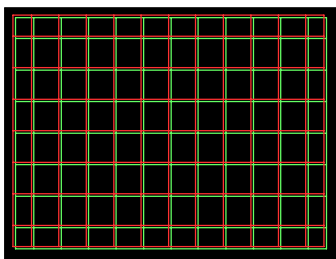
(continued)

## TOUCH-UP ALIGNMENT - RED

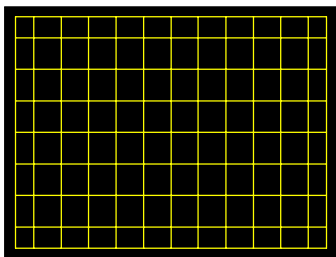
After adjustment of Red, the lines should appear yellow, which is Red and Green together. When pressing the **MENU** button to toggle back to all colors, all lines should be white. Proceed to **Write to ROM** (page 71) when all touch-up adjustments are completed.



13 x 9 Adjustment Locations



Red and Green - Before Adjustment



Red and Green - After Adjustment

# TOUCH-UP ALIGNMENT - BLUE

**1. ENTER DCAM** (Digital Convergence Adjustment Mode) Default is 13 x 9 Mode.

**AP-5x/AP-6x:** Press service switch behind hole on front panel for all AP-5x and AP-6x chassis. (*Figure 1*)

**All Other Chassis:** Press service switch on the Deflection PWB. (*Figure 2*) or, for models built after 2000, to access the DCAM without removing the front panel;

Procedure for Chassis DP14G, DP15, DP17:

- 1) Press the **MAGIC FOCUS** button on front panel.
- 2) While Magic Focus is running, press **MAGIC FOCUS** button again to "stop".
- 3) When "STOP" is displayed in OSD, press **RECALL** or **STATUS** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP23/23G, DP24, DP26, DP27:

- 1) Press the **MAGIC FOCUS** button on front panel.
- 2) While Magic Focus is running, press **MAGIC FOCUS** button again to "stop".
- 3) When "STOP" is displayed in OSD, press **INFO** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP06, DP07, HP13:

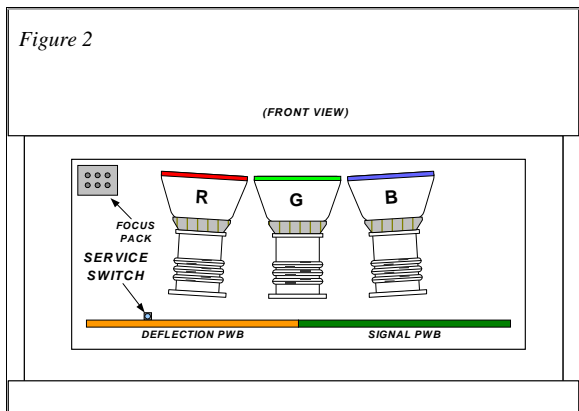
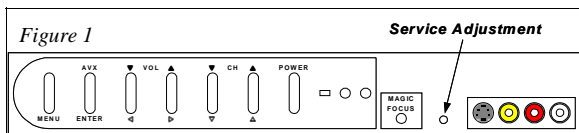
- 1) Press and hold the **MAGIC FOCUS** button on front panel.
- 2) While the button is held down, the OSD will change from "MAGIC FOCUS" to "CENTER MODE", then to "STATIC MODE".
- 3) When "STATIC MODE" is displayed in OSD, press **INPUT** or **ANT** button on remote control.
- 4) The unit will now be in the DCAM.

Procedure for Chassis DP05F, DP05, HP11, HP12:

- 1) Press and hold the **DIGITAL ARRAY** or **CONVERGENCE ADJUST** button on front panel.
- 2) While the button is held down, then press the **INPUT** or **ANT** button on remote control.
- 3) The unit will now be in the DCAM.

(continued)

# TOUCH-UP ALIGNMENT - BLUE



TOUCH-UP  
ALIGNMENT

## 2. SELECT COLOR TO BE ADJUSTED (BLUE)

Press the button on the remote associated with **Color Display Mode (Remove Color)** , then press the button on the remote associated with **Blue / 13 x 9** .

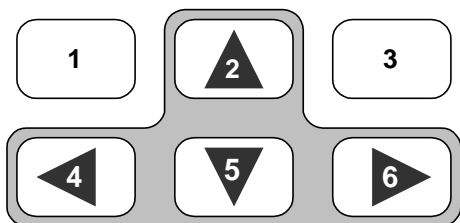
example: **MENU, INPUT**

Display should now be Blue and Green crosshatch lines only. If it is all three colors, press the **MENU** button again to toggle from all colors back to Blue and Green only.

(continued)

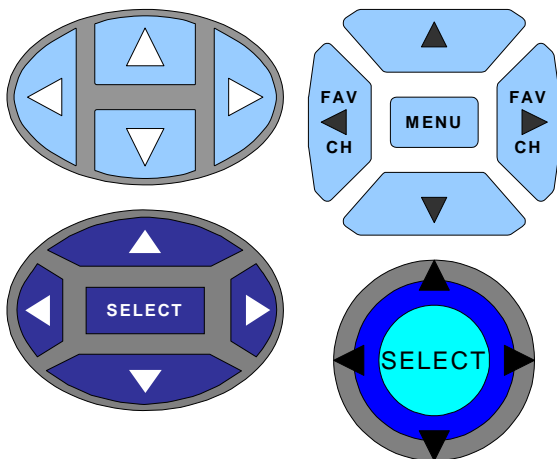
## TOUCH-UP ALIGNMENT - BLUE

3. Use the **Cursor Position Buttons** to navigate from a selected adjustment point to another adjustment point. The blinking or dashed lines of the crosshatch intersection identifies the selected adjustment point.



TOUCH-UP  
ALIGNMENT

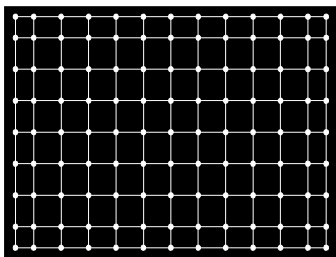
4. Press the **Cursor Adjustment Buttons** at the selected adjustment points to align the blue H / V lines with the green H / V lines.



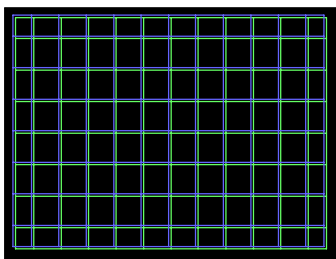
(continued)

## TOUCH-UP ALIGNMENT - BLUE

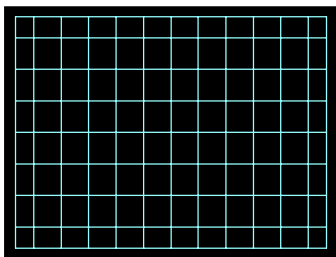
After adjustment of Blue, the lines should appear cyan, which is Blue and Green together. When pressing the **MENU** button to toggle back to all colors, all lines should be white. Proceed to **Write to ROM** (page 71) when all touch-up adjustments are completed.



13 x 9 Adjustment Locations



Blue and Green - Before Adjustment



Blue and Green - After Adjustment



# TOUCH-UP ALIGNMENT

## WRITE TO ROM

When convergence is complete, write the new data to ROM. Press the button on the remote associated with **Write to ROM** twice.

Example 1: **MOVE, MOVE**

Example 2: **PIP MODE, PIP MODE**

The screen will blank for approx. 20 seconds. When ROM WRITE is complete, green dots will appear on the screen. At this point, pressing the **MUTE** button will return to the crosshatch display.

TOUCH-UP  
ALIGNMENT

1ST BUTTON PRESS



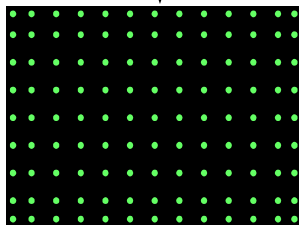
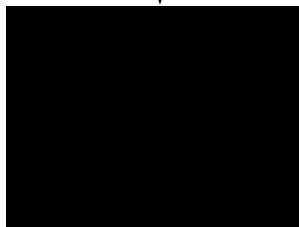
2ND BUTTON PRESS



APPROX. 20 SECONDS



ROM WRITE COMPLETE



(continued)

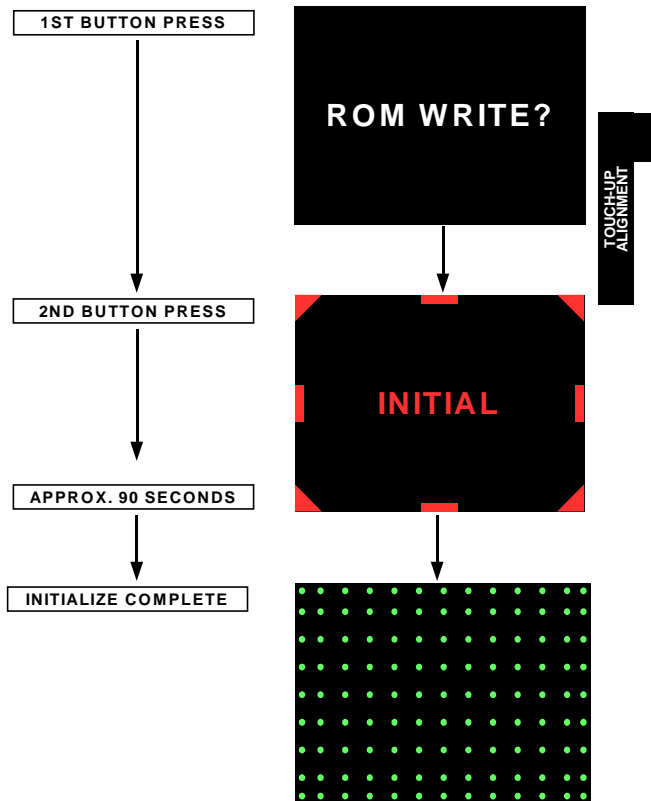
# TOUCH-UP ALIGNMENT

## INITIALIZE SENSORS

When **WRITE TO ROM** is complete, the Magic Focus Sensors need to be initialized. Press the button on the remote associated with **Write to ROM**, then press the button on the remote associated with **Initialize**.

Example 1: **MOVE, PIP CH**

Example 2: **PIP MODE, PIP CH**



If error codes display after this step, see page 95.

## COMPLETE ALIGNMENT

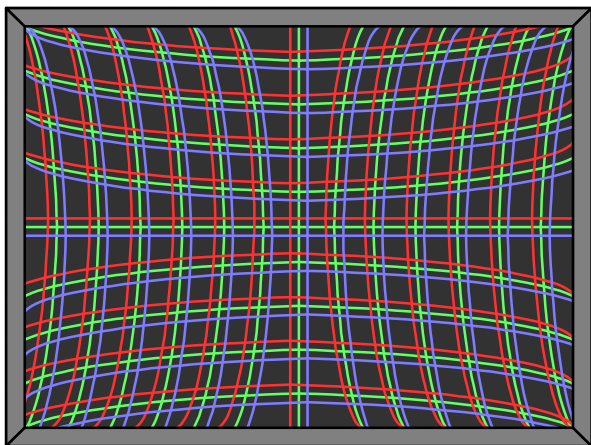
Clear RAM.....	74
Magnetic Centering.....	75
Horizontal and Vertical Size.....	77
Static Centering.....	78
Phase Adjustment.....	79
Green 3 x 3 Mode.....	81
Green 7 x 5 Mode.....	83
Green 13 x 9 Mode.....	85
Red/Blue 3 x 3 Mode.....	87
Red/Blue 7 x 5 Mode.....	89
Red/Blue 13 x 9 Mode.....	91
Write to ROM.....	93
Initialize Sensors.....	94

# COMPLETE ALIGNMENT

## CLEAR RAM

To clear the DCU RAM, this is accomplished by holding down the service switch then powering on the set. This will result in a display that has its convergence completely uncorrected. Note that this is not necessarily a permanent condition. All the previous convergence settings that were stored in the ROM are still there. The important thing to remember here is the difference between RAM (Random Access Memory) and ROM (Read Only Memory). RAM is what the convergence output devices are using for an input at any given time, and ROM is what data settings were actually written to the EEPROM.

COMPLETE  
ALIGNMENT



Example of uncorrected convergence crosshatch

# COMPLETE ALIGNMENT MAGNETIC CENTERING

After clearing the DCU RAM, the next step is to perform the magnetic centering for each CRT.

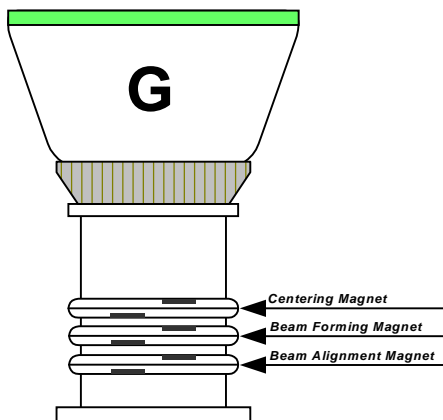
Using an external pattern generator, input a single crosshatch pattern.

Apply the screen overlay. (*page 6*)

Display normal video.

Press the button on the remote associated with **Crosshatch/Video Mode** five (5) times.

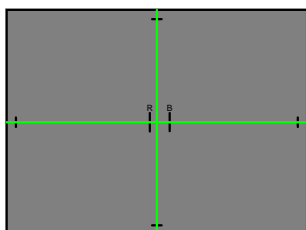
Example: **EXIT (x5)**



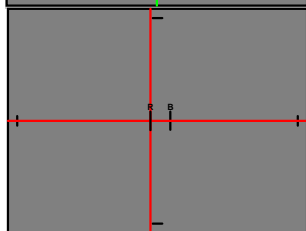
(continued)

# COMPLETE ALIGNMENT MAGNETIC CENTERING

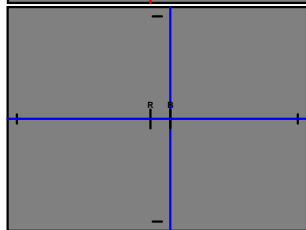
Using the CRT magnets (centering rings), align each color as described in the diagrams below. The horizontal line (left/right) for each color should be aligned with the center horizontal line of the overlay. The vertical line (up/down) for each color should be positioned as shown, which is offset. This is done so that the Convergence Output devices (STK's) will operate in a more efficient manner, thus preventing possible memory overload in the DCU and causing an error during sensor initialization. For example, the Blue is offset to the right because the Blue CRT is physically to the right of center (Green).



**Single  
Crosshatch  
Green  
Centered**



**Single  
Crosshatch  
Red  
Centered  
(offset)**



**Single  
Crosshatch  
Blue  
Centered  
(offset)**

# COMPLETE ALIGNMENT

## Horizontal / Vertical Size Adjust

After the magnetic centering has been accomplished, the master size adjustment should be checked, and adjusted if necessary.

Apply the screen overlay. (page 6)

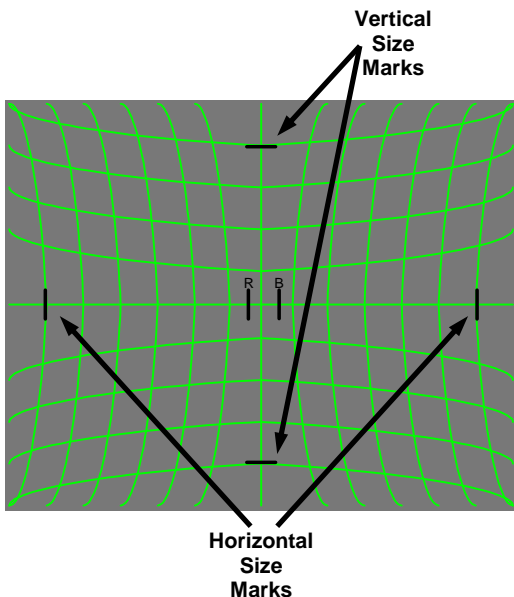
Clear the DCU RAM. (page 74)

Select Green Only

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Green Only / 3 x 3**.

Example: **MENU, RECALL**

Adjust horizontal and vertical size controls (usually located on the Power/Deflection PWB) so that the raster size corresponds to the size marks on the overlay.



# COMPLETE ALIGNMENT

## STATIC CENTERING

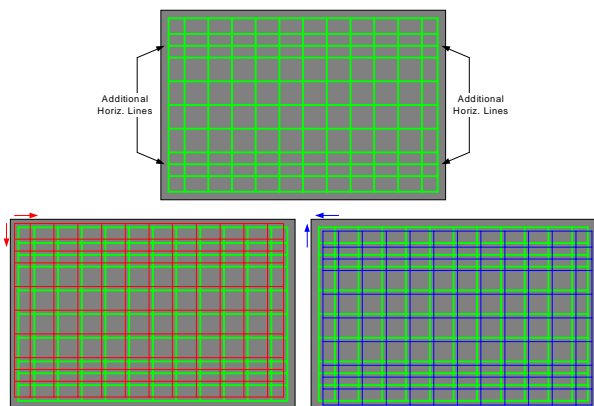
After the magnetic centering and size adjustments have been verified, the Static Centering should then be adjusted. The screen overlay should be in place, and the DCU RAM should still be cleared.

Enter the Static Raster Centering Mode

Press the button on the remote associated with **Centering**.

Example: **FREEZE**

Two additional horizontal lines will appear, to indicate that the set is now in the Static Raster Centering Mode.



To select Red or Blue, press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Red / 7 x 5** or **Blue / 13 x 9**.

Example: **MENU, 0** (Red)

Example: **MENU, INPUT** (Blue)

Adjust each color using the **Correction Buttons** until the center is a white cross.

After adjustment is complete, press the button on the remote associated with **Centering** to exit from the Static Raster Centering Mode.

Example: **FREEZE**



# COMPLETE ALIGNMENT

## DCU PHASE ADJUST

Apply the screen overlay. (page 6)

Enter DCAM by either pressing the service only switch, or by remote command. (see page 63)

Select Green Only

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Green Only / 3 x 3**

Example: **MENU, RECALL**

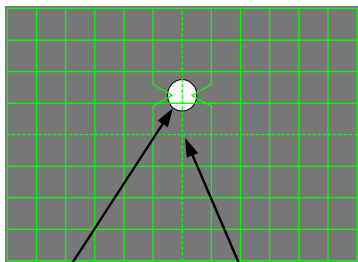
Enter Phase Adjustment Mode

Press the button on the remote\* associated with **Phase Adjust.**

Example: **HELP**

\* Some remotes can not enter Phase Adjustment Mode.

***NOTE:** All 2H models built since 2000 (DP-0x, DP-1x, and DP-2x) have data values for Phase Adjust. Refer to pages 100 - 133 for specific 2H model data.*



The point between the bent lines represents the Adjustment Point location.

The broken line intersection represents the center of the screen.

(continued)

# COMPLETE ALIGNMENT

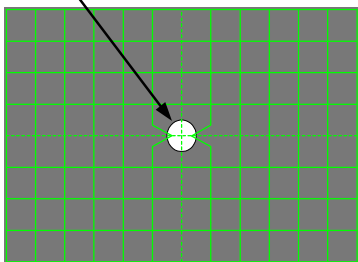
## DCU PHASE ADJUST

Using the **Correction Buttons** on the remote, position the bent lines so that they are aligned with the center of the screen as shown below.

To exit from the Phase Adjustment Mode, press the button on the remote associated with **Phase Adjust**.

Example: **HELP**

Matches external  
video center



COMPLETE  
ALIGNMENT

This assures that the  
convergence adjustment  
occurs precisely at the  
selected cursor position.

# COMPLETE ALIGNMENT

## GREEN 3 x 3 Mode

The first step in making convergence corrections is to ensure that the Green crosshatch is matched to the overlay. If the DCU RAM was cleared, it will be possible to enter the 3 x 3 mode. Otherwise, when entering into the DCAM, the default mode will be 13 x 9, which is the touch-up mode.

Apply the screen overlay. (page 6)

Clear the DCU RAM. (page 74)

Ensure that all size and centering adjustments have been performed correctly. (pages 75-80)

Select 3 x 3 Mode.

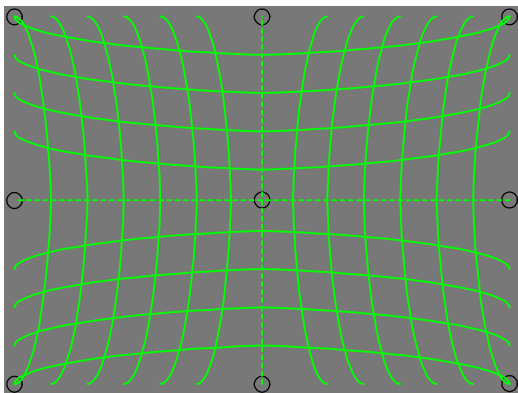
Press the button on the remote associated with **Green Only / 3 x 3** five (5) times.

Example: **RECALL** (x 5)

Select Green Only

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Green Only / 3 x 3**

Example: **MENU, RECALL**



**3 x 3 Mode = 9 Adjustment Points - Before Adjustment**

(continued)

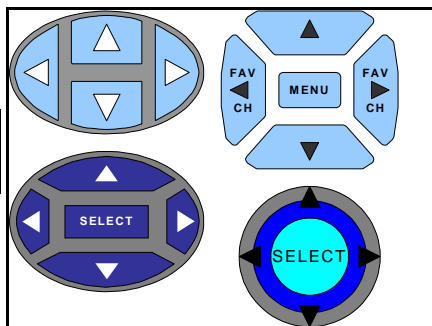
# COMPLETE ALIGNMENT

## GREEN 3 x 3 Mode

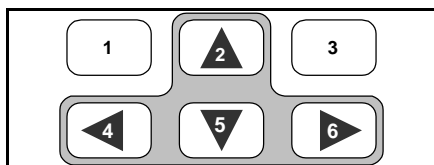
The intersection of the two (H and V) dashed lines represents the selected adjustment point. Press the **Correction Buttons** at the selected adjustment point to align with the horizontal and vertical lines of the screen overlay.

Use the **Cursor Position Buttons** to navigate between adjustment points.

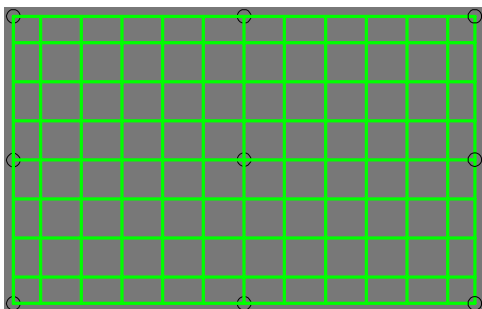
**Correction  
Buttons**



**Cursor  
Position  
Buttons**



COMPLETE  
ALIGNMENT



**3 x 3 Mode = 9 Adjustment Points - After Adjustment**

# COMPLETE ALIGNMENT

## GREEN 7 x 5 Mode

### Select 7 x 5 mode.

Press the button on the remote associated with **Red / 7 x 5** five (5) times.

Example: **0** (x 5)

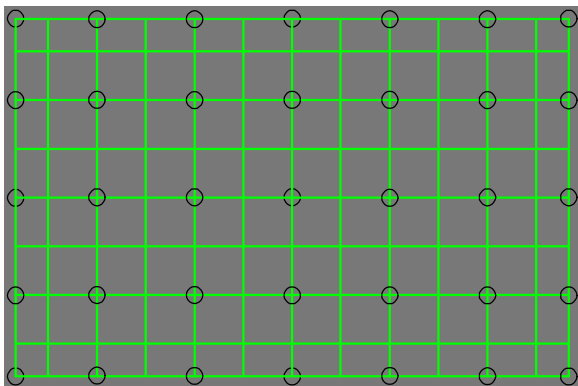
### Select Green Only

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Green Only / 3 x 3**

Example: **MENU, RECALL**

Press the Correction Buttons (**▲**, **▼**, **◀**, **▶**) at the selected adjustment points to align the display with the horizontal and vertical lines of the screen overlay.

Use the Cursor Position Buttons (**2**, **4**, **5**, **6**) to navigate between the adjustment points.



**7 x 5 Mode = 35 Adjustment Points - After Adjustment**

*(continued)*

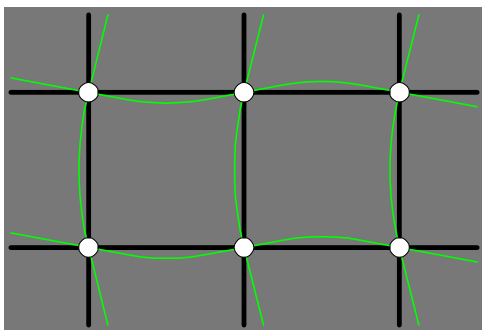
# COMPLETE ALIGNMENT

## GREEN 7 x 5 Mode

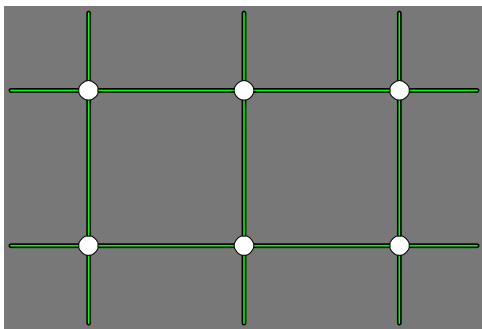
Perform Interpolation as needed to correct for 'S' distortion between points. Interpolation is basically a mathematical operation that reduces the distance between two points. This will average the error between points to correct the bent or curved lines. This should always be done while in the 7 x 5 mode.

NOTE: Some Remotes do not have the capability for performing this operation. See pages 11-58 to determine each remote's capabilities.

Example: **INFO**



**Before Interpolation**



**After Interpolation**

COMPLETE  
ALIGNMENT

# COMPLETE ALIGNMENT

## GREEN 13 x 9 Mode

### Select 13 x 9 mode.

Press the button on the remote associated with **Blue / 13 x 9** five (5) times.

Example: **INPUT** (x 5)

### Select Green Only

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Green Only / 3 x 3**

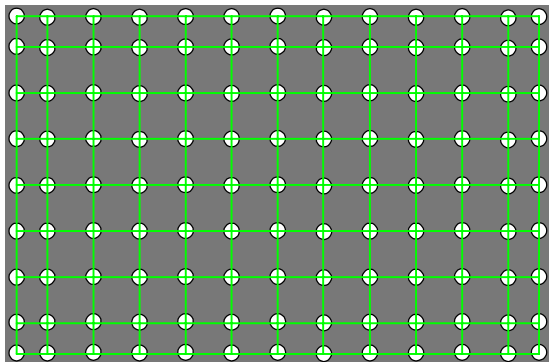
Example: **MENU, RECALL**

Press the Correction Buttons (**▲**, **▼**, **◀**, **▶**) at the selected adjustment points to align the display with the horizontal and vertical lines of the screen overlay.

Use the Cursor Position Buttons (**2**, **4**, **5**, **6**) to navigate between the adjustment points. Return to the 7 x 5 mode as necessary to perform interpolation calculation.

*Note: At this point, the green crosshatch should be perfectly aligned with the overlay. If it is not, return to the 7 x 5 mode or, if necessary, the 3 x 3 mode to make required adjustments, until it matches the overlay.*

***Do not continue until green matches the overlay!***



**13 x 9 Mode = 117 Adjustment Points - After Adjustment**

**GREEN  
COMPLETE**

**COMPLETE  
ALIGNMENT**



# COMPLETE ALIGNMENT

## RED/BLUE 3 x 3 Mode

The next step in making convergence corrections is to ensure that the Red and the Blue crosshatch is matched to the Green (which was matched to the overlay). If the DCU RAM was cleared, it will be possible to enter the 3 x 3 mode. Otherwise, when entering into the DCAM, the default mode will be 13 x 9, which is the touch-up mode.

### Select 3 x 3 Mode.

Press the button on the remote associated with **Green Only / 3 x 3** five (5) times.

Example: **RECALL** (x 5)

### Select (Red and Green) or (Blue and Green)

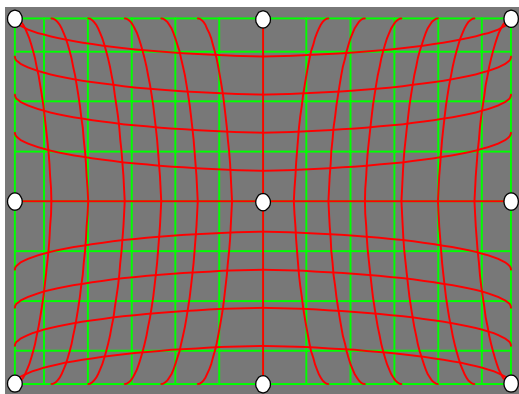
Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Red / 7 x 5**, or **Blue / 13 x 9**.

Example: **MENU, 0** (Red)

or,

**MENU, INPUT** (Blue)

Note: The following diagrams only show Red and Green. First do one color completely, then the other. It makes no difference which one is done first.



**3 x 3 Mode = 9 Adjustment Points - Before Adjustment**

*(continued)*

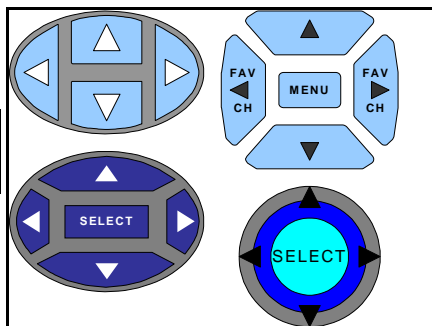
# COMPLETE ALIGNMENT

## RED/BLUE 3 x 3 Mode

The intersection of the two (H and V) dashed lines represents the selected adjustment point. Press the **Correction Buttons** at the selected adjustment point to align with the horizontal and vertical lines of the screen overlay.

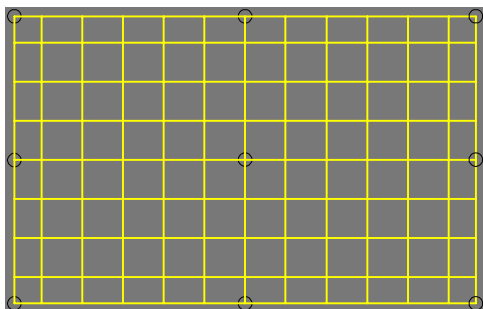
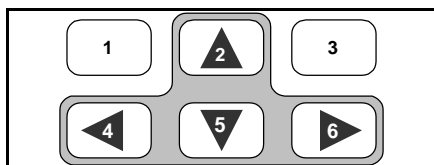
Use the **Cursor Position Buttons** to navigate between adjustment points.

**Correction  
Buttons**



COMPLETE  
ALIGNMENT

**Cursor  
Position  
Buttons**



**3 x 3 Mode = 9 Adjustment Points - After Adjustment**

# COMPLETE ALIGNMENT

## RED/BLUE 7 x 5 Mode

### Select 7 x 5 mode.

Press the button on the remote associated with **Red / 7 x 5** five (5) times.

Example: **0** (x 5)

### Select (Red and Green) or (Blue and Green)

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Red / 7 x 5**, or **Blue / 13 x 9**.

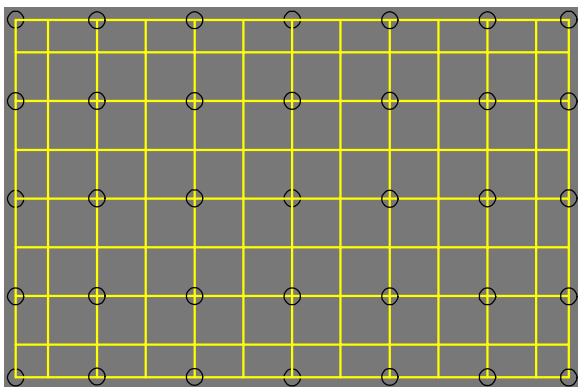
Example: **MENU, 0** (Red)

or,

**MENU, INPUT** (Blue)

Press the Correction Buttons (**▲**, **▼**, **◀**, **▶**) at the selected adjustment points to align the display with the horizontal and vertical lines of the screen overlay.

Use the Cursor Position Buttons (**2**, **4**, **5**, **6**) to navigate between the adjustment points.



**7 x 5 Mode = 35 Adjustment Points - After Adjustment**

*(continued)*

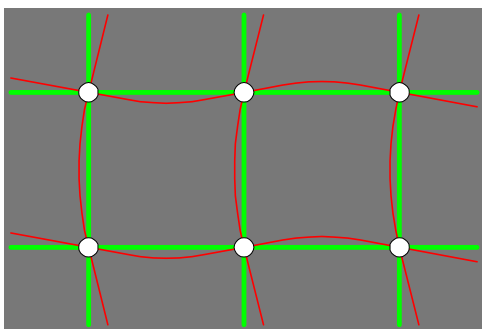
# COMPLETE ALIGNMENT

## RED/BLUE 7 x 5 Mode

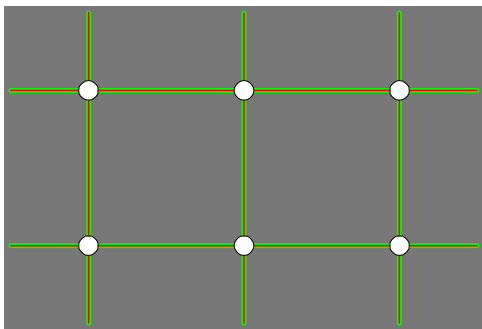
Perform Interpolation as needed to correct for 'S' distortion between points. Interpolation is basically a mathematical operation that reduces the distance between two points. This will average the error between points to correct the bent or curved lines. This should always be done while in the 7 x 5 mode.

NOTE: Some Remotes do not have the capability for performing this operation. See pages 11-58 to determine each remote's capabilities.

Example: **INFO**



**Before Interpolation**



**After Interpolation**

COMPLETE  
ALIGNMENT

# COMPLETE ALIGNMENT

## RED/BLUE 13 x 9 Mode

Select 13 x 9 mode.

Press the button on the remote associated with **Blue / 13 x 9** five (5) times.

Example: **INPUT** (x 5)

Select (Red and Green) or (Blue and Green)

Press the button on the remote associated with **Color Display Mode (Remove Color)**, then press the button on the remote associated with **Red / 7 x 5**, or **Blue / 13 x 9**.

Example: **MENU, 0** (Red)

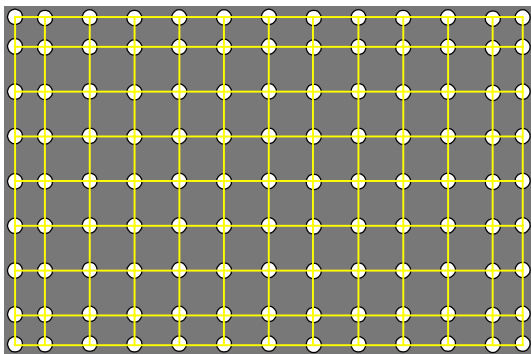
or,

**MENU, INPUT** (Blue)

Press the Correction Buttons (**▲**, **▼**, **◀**, **▶**) at the selected adjustment points to align the display with the horizontal and vertical lines of the screen overlay.

Use the Cursor Position Buttons (**2**, **4**, **5**, **6**) to navigate between the adjustment points. Return to the 7 x 5 mode as necessary to perform interpolation calculation.

*Note: At this point, the Red/Blue crosshatch should be perfectly aligned with the Green. If it is not, return to the 7 x 5 mode or, if necessary, the 3 x 3 mode to make required adjustments, until it matches the Green.*



**13 x 9 Mode = 117 Adjustment Points - After Adjustment**

**RED/BLUE  
COMPLETE**

**COMPLETE  
ALIGNMENT**

# COMPLETE ALIGNMENT

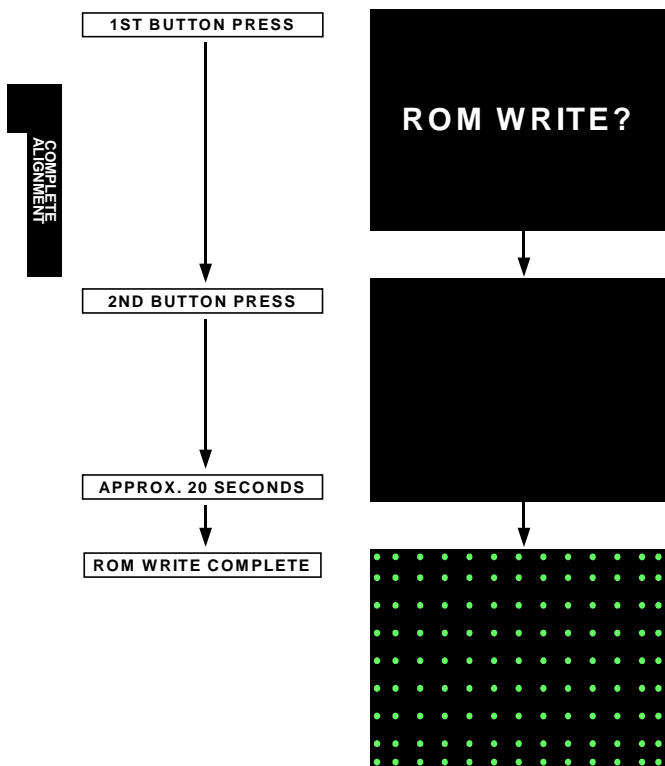
## WRITE TO ROM

When convergence is complete, write the new data to ROM. Press the button on the remote associated with **Write to ROM** twice.

Example 1: **MOVE, MOVE**

Example 2: **PIP MODE, PIP MODE**

The screen will blank for approx. 20 seconds. When ROM WRITE is complete, green dots will appear on the screen. At this point, pressing the **MUTE** button will return to the crosshatch display.



*(continued)*

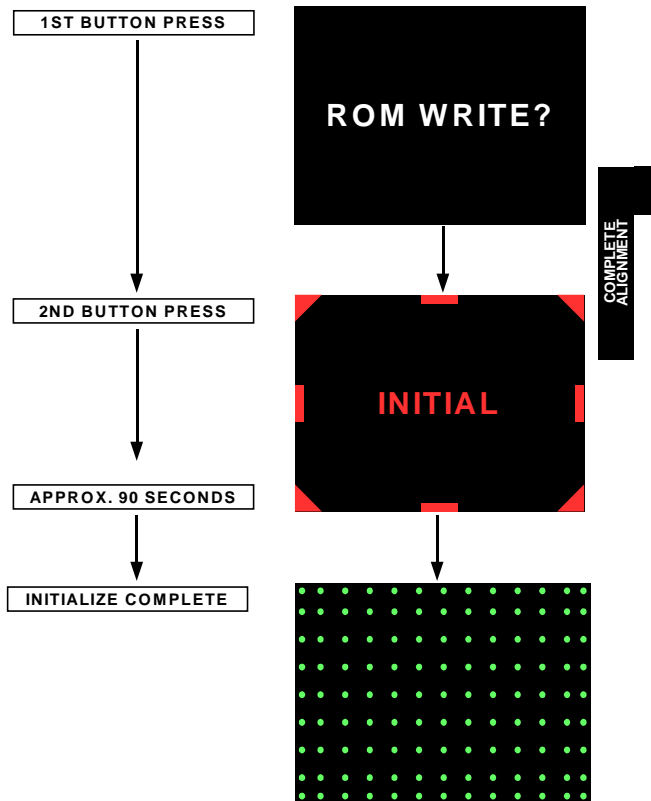
# COMPLETE ALIGNMENT

## INITIALIZE SENSORS

When **WRITE TO ROM** is complete, the Magic Focus Sensors need to be initialized. Press the button on the remote associated with **Write to ROM**, then press the button on the remote associated with **Initialize**.

Example 1: **MOVE, PIP CH**

Example 2: **PIP MODE, PIP CH**



If error codes display after this step, see page 95.



# DCU ERROR CODES

If an error code appears after Magic Focus operation or during the Sensor Initialization procedure, refer to the following table to determine the possible area at fault.

ERROR CODE	ERROR MESSAGE	COUNTERMEASURE	APPLICATION	
			Magic Focus	Sensor Initialize
1	VF Error	Replace DCU	X	X
2	Connect 1	Darken outside light Placement of Sensor Is pattern hitting Sensor? Check connections Replace Sensor Replace Sensor PWB Sensor connections Replace DCU Adjustment check (H / V)		X
3	A/D Level	Same as Error Code 2	X	X
4	Overflow	Placement of Sensor Adjustment check (H / V) Conv. Amp Gain check*		X
5	Convergence	Same as Error Code 4	X	X
7	Operation	Same as Error Code 4	X	X
9	Connect 2	Same as Error Code 2	X	X
10	Noise	Input strong strength signal Check conn. DCU/Sensor	X	X
11	Sync	Input strong strength signal Input standard NTSC signal	X	X

\* Check convergence yoke return resistor values

# 2H MODEL PROCEDURES

## General 2H Model Information

Most of the Hitachi 2H (HDTV capable) models require that additional procedures be performed. This is due to the fact that the horizontal or vertical deflection is manipulated in some way, to properly display the input HDTV signal. (An example would be a 4:3 model displaying a 1080i image, which is 16:9) On the older 2H models, (pre-2001) the additional procedure involves simply doing the entire convergence procedure a second time, using a different overlay and engaging the manipulated deflection mode. However, on the newer 2H models, there are other adjustments that need to be performed *before* even starting the convergence correction procedures, such as DCU Character Set-up, and DCU Pattern Set-up. These additional adjustments are necessary because the same DCU is used in a multitude of cabinet sizes and the light pattern must strike the sensors correctly for Magic Focus to function as well as the correct "wording" must be seen. Understand that as this document is prepared, newer and/or more up to date alignment information can be located on our website, <http://www.hitachiserviceusa.com>

## 2H MODEL PROCEDURES

### DP-85 Procedures

The DP-85 has two convergence modes; Normal and Smooth-Wide. Since the TV manipulates the horizontal deflection in Smooth Wide mode only, the technician must converge the unit in both Normal mode and Smooth Wide mode. There are two different overlays to be used. See page 9 for the actual part numbers.

Note: This unit has four modes; Normal, Full, Fill, and Smooth-Wide. Normal, Full, and Fill are considered equivalent modes when pertaining to convergence, as only the Smooth-Wide mode manipulates the horizontal deflection by changing the linearity of the horizontal deflection waveform.

To access Normal (or Full, or Fill) mode:

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Using the remote, press MENU > Preferences > Screen Format > Normal.
3. Press the Service switch.

To access Smooth-Wide mode:

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Using the remote, press MENU > Preferences > Screen Format > Smooth-Wide.
3. Press the Service switch.

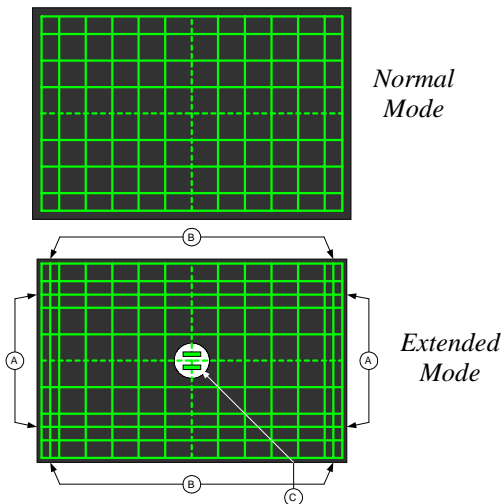
Proceed with Digital Convergence Adjustments. It is highly recommended to perform the WRITE TO ROM operation after completing the first of the two mode convergence procedures, otherwise you will run the risk of losing your stored data, if you attempt to engage 3 x 3 mode, which requires clearing the RAM.

*(continued)*

# 2H MODEL PROCEDURES

## DP-85 Procedures

The DP-85 has an additional feature to be used during convergence that is unique to the Smooth-Wide mode. This is due to the image being noticeably wider than the standard image of the past. (The DP-85 was Hitachi's first 2H 16:9 model) There is an additional mode or function that can be used when making convergence corrections. This is called the **Extended Mode**, and is entered by pressing the **PIP CH** button.



A = Two additional Horizontal lines. Not used.

B = Two additional Vertical lines. These lines are used to align to the overlay. The proper actual adjustment at the sides will commonly be outside the viewing area of the screen, so these additional lines are used. Note that when adjusting the convergence at the sides, it may take a little longer than usual to get the lines exactly on the grid of the overlay. It's more important that the lines are straight rather than precisely on the grid. (specification is 1 ~ 2 mm)

C = The intersection of dotted lines now includes a solid upper and lower bar which will be either Red, Green, or Blue; depending on which color is being adjusted. In the case of the above example, it is showing green.

# 2H MODEL PROCEDURES

## DP-86 Procedures

The DP-86 has two convergence modes; Normal (or Progressive) and HD (or High Definition). Since the TV manipulates the horizontal deflection in HD mode by increasing the scanning frequency (from 31.5 KHz to 33.75 KHz), the technician must converge the unit in both Normal mode and HD mode. There are two different overlays to be used. See page 9 for the actual part numbers.

To access Normal (or Progressive) mode:

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.

To access HD mode:

1. Input an ATSC signal of 1080i at the component input connections.
2. Press the Service switch.

Proceed with Digital Convergence Adjustments. It is highly recommended to perform the WRITE TO ROM operation after completing the first of the two mode convergence procedures, otherwise you will run the risk of losing your stored data, if you attempt to engage 3 x 3 mode, which requires clearing the RAM.

## 2H MODEL PROCEDURES

### DP-0x Procedures

The DP-0x has two convergence modes; Normal (or Progressive) and HD (or High Definition). Since the TV manipulates the horizontal deflection in HD mode, the technician must converge the unit in both Normal mode and HD mode. There are two different overlays to be used. See page 9 for the actual part numbers.

Note 1: The DP-05F does not have the Magic Focus feature, therefore it is unnecessary to initialize the Magic Focus Sensors. (there are none).

Note 2: The 61" DP-06 (61SDX01B) does not have it's own 61" overlays. Use the part number shown on page 9, which happens to be the same 60" overlay used on the previous years model 60SDX88B. Center the overlay on the screen; there will be a 0.5" gap around the overlay.

Note 3: There are two adjustments which are unique to the DP-0x series; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST. These must be properly adjusted *before* starting the convergence correction adjustments.

### DCU PHASE ADJUST

#### Normal (Progressive) Mode

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **HELP** button on remote. (Green crosshatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown below by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown below by using the **2** and **5** button on the remote.

(continued)

## 2H MODEL PROCEDURES

### DP-0x Procedures

7. Set CR-H phase data as shown below by using the ◀ and ▶ button on the remote.
8. Set CR-V phase data as shown below by using the ▲ and ▼ button on the remote.
9. Press **HELP** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

### DCU PHASE ADJUST

#### HD Mode

1. Input an ATSC signal of 1080i at the component input connections.
2. Repeat steps 2 - 11 above.

#### NORMAL MODE

##### PHASE MODE

PH-H: BB

PH-V: 0C

CR-H: 4C

CR-V: 00

#### HD MODE

##### PHASE MODE

PH-H: BB

PH-V: 07

CR-H: 4C

CR-V: 0C

(continued)

# 2H MODEL PROCEDURES

## DP-0x Procedures

### HORIZONTAL POSITION ADJUST

#### Normal (Progressive) Mode

1. Input an NTSC circle pattern test signal.
2. Ensure that the screen format is PROGRESSIVE.
3. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSI on Page 2 of Service Menu.
4. Adjust the data so that the left and right hand sides are equal.
5. Press the **MENU** button to exit from the Service Menu.

### HORIZONTAL POSITION ADJUST

#### HD Mode

1. Input an ATSC 1080i circle pattern test signal.
2. Ensure that the screen format is HD.
3. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSI on Page 2 of Service Menu
4. Adjust the data so that the left and right hand sides are equal.
5. Press the **MENU** button to exit from the Service Menu.

#### Service Menu access and how to view/change the I<sup>2</sup>C Data values:

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

PAGE 02		
TA 1300 NTSC		
	H POSI	30
FLEX CONT		
	VD-POS	3F
UPD64081		
	DYGA	09
	DCGA	06
	VAPGA	05
	VAPIN	0B
	YHCOR	00

*Note: Value shown may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.



## 2H MODEL PROCEDURES

### DP-14G Procedures

The DP-14G has only one deflection mode however, there are two adjustments which must be properly adjusted *before* starting the convergence correction adjustments; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST.

### DCU PHASE ADJUST

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **HELP** button on remote. (Green crosshatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown below by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown below by using the **2** and **5** button on the remote.
7. Set CR-H phase data as shown below by using the ◀ and ▶ button on the remote.
8. Set CR-V phase data as shown below by using the ▲ and ▼ button on the remote.
9. Press **HELP** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

#### PHASE MODE

PH-H: BF

PH-V: 07

CR-H: 4C

CR-V: 0C

(continued)

## 2H MODEL PROCEDURES

### DP-14G Procedures

#### HORIZONTAL POSITION ADJUST

1. Input an NTSC crosshair signal.
2. Press the Service switch to change to internal DCU crosshatch.
3. Mark the center of the DCU crosshatch with your finger.
4. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSI.
5. Adjust the data so that the center of NTSC crosshair matches the location found in step 3 above.
6. Press the **MENU** button to exit from the Service Menu.

#### Service Menu access and how to view/change the I<sup>2</sup>C Data values:

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

(PAGE 01)	
ADJUST MODE	
SERVICE	<input type="checkbox"/>
SUB BRT	<input type="checkbox"/>
WHITE BAL	<input type="checkbox"/>
R DRV (COOL)	3F
B DRV (COOL)	3F
R CUTOFF (COOL)	80
G CUTOFF (COOL)	80
B CUTOFF (COOL)	80
<b>H POSITION</b>	<b>3F</b>
V POSITION	3F
FACT RESET	<input type="checkbox"/>

*Note: Value shown may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.

*(continued)*

## 2H MODEL PROCEDURES

### DP-14G Procedures

There are two additional adjustments which must be performed when replacing a DCU. These are called **DCU Character Set-up**, and **DCU Pattern Set-up**. These adjustments must be performed prior to making convergence corrections.

#### DCU Character Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **PIP CH** button on remote. ADJ PARAMETER mode will now be displayed.
5. Press ▲ or ▼ button to scroll through the table.
6. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
7. Press **PIP MODE** button twice to write the data to the EEPROM.
8. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

ADJ. PARAMETER ROM WRITE?		
➡	ADJ. DISP	77
	SEL. STAT	00
	DEMO WAIT	2F

(continued)

# 2H MODEL PROCEDURES

## DP-14G Procedures

### DCU Character Set-up Table

Parameter	Normal
ADJ.DISP	77
SEL. STAT	00
DEMO WAIT	2F
INT STEP 1	02
INT A DLY	0A
INT C DLY	FA
INT BAR	1C
MGF STEP 1	00
MGF A DLY	0A
MGF C DLY	FA
MGF BAR	0E
SENSOR CK	00
SENSOR 0	FF
SENSOR 1	00
SENSOR 2	FF
SENSOR 3	01
SENSOR 4	FF
SENSOR 5	06
SENSOR 6	FF
SENSOR 7	07
AD LEVEL	03
E. DISPLAY	00
ADJ. TIMS	60
AD LEVEL	05
AD NOISE	80
PHASE MOT	60
H. BLK-RV	03
H. BLK-GV	01
H. BLK-BV	03
H. BLK-H	00
PON DELAY	0C
IR-CODE	00
INITIAL 50	9E
MGF 50	96
9 POINT 50	FE
STAT 50	FE
DYNA 50	9F

(continued)

## 2H MODEL PROCEDURES

### DP-14G Procedures

#### DCU Pattern Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **HELP** button on remote. Magic Focus Pattern Mode will now be displayed.
5. Press the **6** button to rotate the arrow. (Arrow indicates each sensor position)
6. Press the buttons shown below to switch colors.

**STATUS** = Green

**0** = Red

**ANT** = Blue

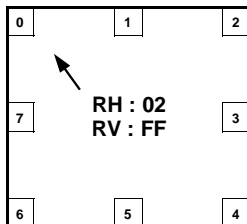
7. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
8. Press ▲ or ▼ button to scroll vertically (RH, ▼, RV, for example).
9. Press **PIP MODE** button twice to write the data to the EEPROM.
10. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

(continued)

# 2H MODEL PROCEDURES

## DP-14G Procedures

### DCU Pattern Set-up Tables



43UWX10B ONLY								
	0	1	2	3	4	5	6	7
RH	02	02	FA	FE	FC	02	04	02
RV	00	00	03	00	FE	01	01	00
GH	02	02	FA	FE	FC	00	04	02
GV	00	00	03	00	FE	01	01	00
BH	04	FE	FC	FE	FA	FE	04	02
BV	03	00	01	00	00	01	FE	00

53UWX10B / 61UWX10B								
	0	1	2	3	4	5	6	7
RH	02	02	FA	FE	FC	02	04	02
RV	00	00	03	00	FE	01	01	00
GH	04	00	FE	FE	FE	00	04	02
GV	02	00	03	00	00	01	00	00
BH	04	FE	FC	FE	FA	FE	04	02
BV	03	00	01	00	00	01	FE	00

## 2H MODEL PROCEDURES

### DP-15 Procedures

The DP-15 has two deflection modes, *Normal mode* and *1080i Through mode* (sometimes called V Squeeze mode). Both modes must be adjusted separately, using separate overlays when applicable. Additionally, there are two adjustments which must be properly adjusted *before* starting the convergence correction adjustments; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST.

### DCU PHASE ADJUST

#### Normal Mode

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **HELP** button on remote. (Green crosshatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, as shown on page 110, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown by using the **2** and **5** button on the remote.
7. Set CR-H phase data as shown by using the ◀ and ▶ button on the remote.
8. Set CR-V phase data as shown by using the ▲ and ▼ button on the remote.
9. Press **HELP** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.
12. Continue with 1080i Through Mode.

(continued)

## 2H MODEL PROCEDURES

### DP-15 Procedures

#### DCU PHASE ADJUST

#### 1080i Through Mode

13. Press the **EXIT** button five (5) times to exit to regular video mode.
14. Change to a 1080i signal.
15. Enter the Customers Menu and select the SET UP tab.
16. Scroll down to PICTURE FORMATS and select ASPECT 5. (1080 Through Mode)
17. Exit from Customer Menu.
18. Press the Service switch.
19. Repeat Steps 3 - 11

#### NORMAL MODE

##### PHASE MODE

PH-H: BF

PH-V: 07

CR-H: 4C

CR-V: 0C

#### 1080i Thru Mode

##### PHASE MODE

PH-H: BF

PH-V: 07

CR-H: 4C

CR-V: 0C

(continued)



## 2H MODEL PROCEDURES

### DP-15 Procedures

#### HORIZONTAL POSITION ADJUST

##### Normal Mode

1. Input an NTSC crosshair signal.
2. Press the Service switch to change to internal DCU crosshatch display.
3. Mark the center of the DCU crosshatch with your finger.
4. Enter the I<sup>2</sup>C Bus alignment menu and select Item **H POSI**.
5. Adjust the data so that the center of NTSC crosshair matches the location found in step 3 above.
6. Press the **MENU** button to exit from the Service Menu.

#### HORIZONTAL POSITION ADJUST

##### 1080i Through Mode

1. Receive any 1080i (2.14H) signal.
2. Change Screen Format to display **16X9 HD** mode.
3. Press the Service switch to change to internal DCU crosshatch display.
4. Mark the center of the DCU crosshatch with your finger.
5. Enter the I<sup>2</sup>C Bus alignment menu and select Item **H POSI**.
6. Press **SELECT** key on R/C. (**H POSI**) option is changed to **HD** mode. **H POSI H** appears). The data for **H POSI 16X9 HD** mode can now be changed.
7. Adjust the data so that the center of NTSC crosshair matches the location found in step 4 above.
8. Press the **MENU** button to exit from the Service Menu.

(continued)

## 2H MODEL PROCEDURES

### DP-15 Procedures

**Service Menu access and how to view/change the I<sup>2</sup>C Data values:**

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

*Note: Values shown below may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.

<i>Normal Mode</i>		<i>1080i Through Mode</i>	
(PAGE 01)		(PAGE 01)	
ADJUST MODE		ADJUST MODE	
SERVICE	<input type="checkbox"/>	SERVICE	<input type="checkbox"/>
SUB BRT	<input type="checkbox"/>	SUB BRT	<input type="checkbox"/>
WHITE BAL	<input type="checkbox"/>	WHITE BAL	<input type="checkbox"/>
R DRV (COOL)	3F	R DRV (COOL)	3F
B DRV (COOL)	3F	B DRV (COOL)	3F
R CUTOFF (COOL)	80	R CUTOFF (COOL)	80
G CUTOFF (COOL)	80	G CUTOFF (COOL)	80
B CUTOFF (COOL)	80	B CUTOFF (COOL)	80
<b>H POSI</b>	<b>3F</b>	<b>H POSI H</b>	<b>3F</b>
V POSITION	3F	V POSITION	3F
FACT RESET	<input type="checkbox"/>	FACT RESET	<input type="checkbox"/>

(continued)

## 2H MODEL PROCEDURES

### DP-15 Procedures

There are two additional adjustments which must be performed when replacing a DCU. These are called **DCU Character Set-up**, and **DCU Pattern Set-up**. These adjustments must be performed prior to making convergence corrections.

#### DCU Character Set-up

##### Normal Mode

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **PIP CH** button on remote. ADJ PARAMETER mode will now be displayed as shown at right.
5. Press **▲** or **▼** button to scroll through the applicable table on the following pages.
6. Press **◀** or **▶** button to change the data so that it corresponds to the applicable table shown on the following pages.
7. Press **PIP MODE** button twice to write the data to the EEPROM.
8. When Green dots appear, press **MUTE** button on remote to return to data display mode.
9. Press **PIP CH** button to return to Display with extra lines mode.
10. Press **FREEZE** button to return to normal DCU grid display.
11. Continue with 1080i through mode at this point.

## 2H MODEL PROCEDURES

### DP-15 Procedures

#### DCU Character Set-up 1080i Through Mode

12. Press the **EXIT** button five (5) times to exit to regular video mode.
13. Change to a 1080i signal.
14. Enter the Customers Menu and select the SET UP tab.
15. Scroll down to PICTURE FORMATS and select ASPECT 5. (1080 Through Mode)
16. Exit from Customer Menu.
17. Press the Service switch.
18. Repeat Steps 3 - 10 for 1080i Through Mode.
19. Power off the TV to exit.

ADJ. PARAMETER ROM WRITE?		
➔	ADJ. DISP	77
	SEL. STAT	00
	DEMO WAIT	2F

(continued)

# 2H MODEL PROCEDURES

## DP-15 Procedures

### DCU Character Set-up Tables

DP-15 53UDX10B, 61UDX10B		
Parameter	Normal	1080i through
ADJ.DISP	77	-
SEL. STAT	00	-
DEMO WAIT	2F	-
INT STEP 1	02	-
INT A DLY	0A	-
INT C DLY	FA	-
INT BAR	1C	-
MGF STEP 1	00	-
MGF A DLY	0A	-
MGF C DLY	FA	-
MGF BAR	0E	-
SENSOR CK	00	-
SENSOR 0	FF	-
SENSOR 1	00	-
SENSOR 2	FF	-
SENSOR 3	01	-
SENSOR 4	FF	-
SENSOR 5	06	-
SENSOR 6	FF	-
SENSOR 7	07	-
AD LEVEL	03	-
E. DISPLAY	00	-
ADJ. TMS	60	-
AD LEVEL	5	-
AD NOISE	80	-
PHASE MOT	60	-
H. BLK-RV	06	03
H. BLK-GV	01	-
H. BLK-BV	06	03
H. BLK-H	00	-
PON DELAY	0C	-
IR-CODE	00	-
INITIAL 50	9E	-
MGF 50	96	-
9 POINT 50	FE	-
STAT 50	FE	-
DYNA 50	9F	-

DP-15K 43FDX15B, 43FDX20B		
Parameter	Normal	1080i Through
ADJ.DISP	77	77
DEMO WAIT	2F	2F
INT START	03	03
V. SQUEEZE	F0	F1
INT STEP 1	02	02
INT STEP 2	06	06
INT BAR	30	30
INT DELAY	01	01
MGF STEP 1	00	00
MGF STEP 2	06	06
MFG BAR	1B	1B
MGF DELAY	01	01
SENSOR CK	00	00
PORT 0	00	00
PORT 1	01	01
PORT 2	02	02
PORT 3	03	03
PORT 4	04	04
PORT 5	05	05
PORT 6	06	06
PORT 7	07	07
AD LEVEL	03	03
CENT BAL	01	01
E. DISPLAY	00	00
E. ADJ. TMS	60	60
E. AD LEVEL	05	05
E. AD NOISE	0A	0A
PHASE MOT	60	60
H. BLK-RV	05	03
H. BLK-GV	01	01
H. BLK-BV	05	03
H. BLK-H	00	00
PON DELAY	0C	0C
IR CODE	00	00
INITIAL 50	9E	9E
MGF 50	96	96
CENTER 50	FE	FE
STAT 50	FE	FE
DYNA 50	9F	9F

(continued)

# 2H MODEL PROCEDURES

## DP-15 Procedures

### DCU Character Set-up Tables

DP-15H 53FDX20B		
Parameter	Normal	1080i Through
ADJ.DISP	77	77
DEMO WAIT	2F	2F
INT START	03	03
V. SQUEEZE	F0	F1
INT STEP 1	02	02
INT STEP 2	06	06
INT BAR	30	30
INT DELAY	01	01
MGF STEP 1	00	00
MGF STEP 2	06	06
MFG BAR	1B	1B
MGF DELAY	01	01
SENSOR CK	00	00
PORT 0	00	00
PORT 1	01	01
PORT 2	02	02
PORT 3	03	03
PORT 4	04	04
PORT 5	05	05
PORT 6	06	06
PORT 7	07	07
AD LEVEL	03	03
CENT BAL	01	01
E. DISPLAY	00	00
E. ADJ. TIMS	60	60
E. AD LEVEL	05	05
E. AD NOISE	0A	0A
PHASE MOT	60	60
H. BLK-RV	06	03
H. BLK-GV	01	01
H. BLK-BV	06	03
H. BLK-H	00	00
PON DELAY	0C	0C
IR CODE	00	00
INITIAL 50	9E	9E
MGF 50	96	96
CENTER 50	FE	FE
STAT 50	FE	FE
DYNA 50	9F	9F

DP-15J 53SDX20B, 53SDX20BB		
Parameter	Normal	1080i Through
ADJ.DISP	77	77
DEMO WAIT	2F	2F
INT START	03	03
V. SQUEEZE	F0	F1
INT STEP 1	02	02
INT STEP 2	06	06
INT BAR	2A	2A
INT DELAY	01	01
MGF STEP 1	00	00
MGF STEP 2	06	06
MFG BAR	1B	1B
MGF DELAY	01	01
SENSOR CK	00	00
PORT 0	00	00
PORT 1	01	01
PORT 2	02	02
PORT 3	03	03
PORT 4	04	04
PORT 5	05	05
PORT 6	06	06
PORT 7	07	07
AD LEVEL	03	03
CENT BAL	00	00
E. DISPLAY	00	00
E. ADJ. TIMS	60	60
E. AD LEVEL	05	05
E. AD NOISE	0A	0A
PHASE MOT	60	60
H. BLK-RV	06	03
H. BLK-GV	01	01
H. BLK-BV	06	03
H. BLK-H	00	00
PON DELAY	0C	0C
IR CODE	00	00
INITIAL 50	9E	9E
MGF 50	96	96
CENTER 50	FE	FE
STAT 50	FE	FE
DYNA 50	9F	9F

(continued)

## 2H MODEL PROCEDURES

### DP-15 Procedures

#### DCU Pattern Set-up

##### Normal Mode

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **HELP** button on remote. Magic Focus Pattern Mode will now be displayed as shown at right.
5. Press the **6** button to rotate the arrow. (Arrow indicates each sensor position)
6. Press the buttons shown below to switch colors.

- **STATUS** = Green
- **0** = Red
- **ANT** = Blue

7. Press ◀ or ▶ button to change the data so that it corresponds to the applicable table shown on the following pages.
8. Press ▲ or ▼ button to scroll vertically (RH, ▼, RV, for example).
9. Press **PIP MODE** button twice to write the data to the EEPROM.
10. When Green dots appear, press **MUTE** button on remote to return to data display mode.
11. Press **PIP CH** button to return to Display with extra lines mode.
12. Press **FREEZE** button to return to normal DCU grid display.
13. Continue with 1080i through mode at this point.

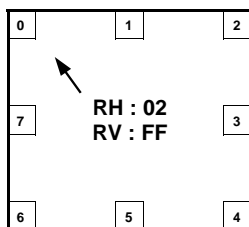
(continued)

## 2H MODEL PROCEDURES

### DP-15 Procedures

#### DCU Pattern Set-up 1080i Through Mode

14. Press the **EXIT** button five (5) times to exit to regular video mode.
15. Change to a 1080i signal.
16. Enter the Customers Menu and select the SET UP tab.
17. Scroll down to PICTURE FORMATS and select ASPECT 5. (1080 Through Mode)
18. Exit from Customer Menu.
19. Press the Service switch.
20. Repeat Steps 3 - 12 for 1080i Through Mode.



(continued)



# 2H MODEL PROCEDURES

## DP-15 Procedures

### DCU Pattern Set-up Tables - Normal Mode

DP-15 CHASSIS: NORMAL MODE								
	0	1	2	3	4	5	6	7
RH	X	02	X	FE	X	02	X	04
RV	X	01	X	00	X	FF	X	00
GH	X	00	X	FE	X	00	X	04
GV	X	01	X	00	X	FF	X	00
BH	X	00	X	FE	X	00	X	04
BV	X	01	X	00	X	FF	X	00
X = Not in use								

DP-15K CHASSIS: NORMAL MODE								
	0	1	2	3	4	5	6	7
RH	06	02	F6	FA	F8	02	08	02
RV	FF	FE	04	00	FC	01	00	00
GH	04	00	FC	00	FC	00	06	02
GV	00	FE	01	00	FE	02	FE	00
BH	06	FE	FC	00	FC	FE	06	02
BV	03	FE	01	00	00	02	FE	00

DP-15J CHASSIS: NORMAL MODE								
	0	1	2	3	4	5	6	7
RH	04	02	FC	00	FC	02	06	02
RV	02	FF	06	00	F9	00	FD	00
GH	04	00	FC	00	FE	00	04	02
GV	04	00	04	00	FB	00	FB	00
BH	06	FE	FC	00	FE	FE	06	04
BV	06	FF	03	00	FD	00	F9	00

DP-15H CHASSIS: NORMAL MODE								
	0	1	2	3	4	5	6	7
RH	06	02	FC	FC	FA	02	06	02
RV	02	FF	04	00	FB	00	FD	00
GH	06	00	FA	FE	FC	00	06	02
GV	03	FF	03	00	FD	00	FD	00
BH	06	FE	FA	FE	FA	FE	06	04
BV	04	FF	01	00	FE	00	FC	00

(continued)

# 2H MODEL PROCEDURES

## DP-15 Procedures

### DCU Pattern Set-up Tables - 1080i Through Mode

DP-15 CHASSIS: 1080i THROUGH MODE								
	0	1	2	3	4	5	6	7
RH	X	02	X	FA	X	02	X	06
RV	X	00	X	00	X	00	X	00
GH	X	00	X	FA	X	00	X	06
GV	X	00	X	00	X	02	X	00
BH	X	00	X	FA	X	00	X	06
BV	X	00	X	00	X	00	X	00
X = Not in use								

DP-15K CHASSIS: 1080i THROUGH MODE:								
	0	1	2	3	4	5	6	7
RH	06	02	F6	F8	F6	02	04	04
RV	FE	FF	04	01	FC	03	02	01
GH	06	00	FC	FC	FC	00	06	04
GV	01	FE	00	01	FF	03	00	01
BH	06	FE	FC	FC	FC	FE	06	06
BV	04	FE	FE	01	00	02	FF	01

DP-15J CHASSIS: 1080i THROUGH MODE								
	0	1	2	3	4	5	6	7
RH	06	02	FC	00	FC	02	08	02
RV	02	FF	08	00	F7	01	FD	00
GH	06	00	FC	00	FE	00	06	02
GV	05	FF	06	00	FA	01	FA	00
BH	08	FE	FC	00	FE	FE	08	04
BV	09	FE	03	00	FD	01	F7	00

DP-15H CHASSIS: 1080i THROUGH MODE								
	0	1	2	3	4	5	6	7
RH	04	02	FC	FE	FC	02	06	02
RV	FF	FF	05	00	FA	01	FF	00
GH	06	00	FC	00	FE	00	06	02
GV	02	FF	03	00	FC	01	FC	00
BH	08	FE	FC	00	FE	FE	08	04
BV	06	FE	02	00	FF	01	F9	00

(continued)

## 2H MODEL PROCEDURES

### DP-17 Procedures

The DP-17 has only one deflection mode however, there are two adjustments which must be properly adjusted *before* starting the convergence correction adjustments; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST.

### DCU PHASE ADJUST

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **HELP** button on remote. (Green crosshatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown below by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown below by using the **2** and **5** button on the remote.
7. Set CR-H phase data as shown below by using the ◀ and ▶ button on the remote.
8. Set CR-V phase data as shown below by using the ▲ and ▼ button on the remote.
9. Press **HELP** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

#### PHASE MODE

PH-H: BF

PH-V: 07

CR-H: 4C

CR-V: 0C

(continued)

## 2H MODEL PROCEDURES

### DP-17 Procedures

#### HORIZONTAL POSITION ADJUST

1. Input an NTSC crosshair signal.
2. Press the Service switch to change to internal DCU crosshatch.
3. Mark the center of the DCU crosshatch with your finger.
4. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSI.
5. Adjust the data so that the center of NTSC crosshair matches the location found in step 3 above.
6. Press the **MENU** button to exit from the Service Menu.

#### Service Menu access and how to view/change the I<sup>2</sup>C Data values:

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

(PAGE 01)		
ADJUST MODE		
SERVICE		<input type="checkbox"/>
SUB BRT		<input type="checkbox"/>
WHITE BAL		<input type="checkbox"/>
R DRV (COOL)	3F	
B DRV (COOL)	3F	
R CUTOFF (COOL)	80	
G CUTOFF (COOL)	80	
B CUTOFF (COOL)	80	
<b>H POSITION</b>	<b>3F</b>	
V POSITION	3F	
FACT RESET		<input type="checkbox"/>

*Note: Value shown may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.

*(continued)*

## 2H MODEL PROCEDURES

### DP-17 Procedures

There are two additional adjustments which must be performed when replacing a DCU. These are called **DCU Character Set-up**, and **DCU Pattern Set-up**. These adjustments must be performed prior to making convergence corrections.

### DCU Character Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **PIP CH** button on remote. ADJ PARAMETER mode will now be displayed.
5. Press ▲ or ▼ button to scroll through the table.
6. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
7. Press **PIP MODE** button twice to write the data to the EEPROM.
8. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

ADJ. PARAMETER ROM WRITE?		
➡	ADJ. DISP	77
	SEL. STAT	2F
	DEMO WAIT	03

(continued)

# 2H MODEL PROCEDURES

## DP-17 Procedures

### DCU Character Set-up Table

Parameter	Normal
ADJ.DISP	77
SEL. STAT	2F
DEMO WAIT	03
INT STEP 1	F0
INT A DLY	02
INT C DLY	06
INT BAR	30
INT DELAY	01
MGF STEP 1	00
MGF STEP 2	06
MGF BAR	1B
MGF DLAY	01
SENSOR CK	00
SENSOR 0	00
SENSOR 1	01
SENSOR 2	02
SENSOR 3	03
SENSOR 4	04
SENSOR 5	05
SENSOR 6	06
SENSOR 7	07
AD LEVEL	03
CENT BAL	01
E. DISPLAY	00
E. ADJ. TMS	60
E. AD LEVEL	05
E. AD NOISE	0A
PHASE MOT	60
H. BLK-RV	03
H. BLK-GV	01
H. BLK-BV	03
H. BLK-H	00
PON DELAY	0C
IR-CODE	00
INITIAL 50	9E
MGF 50	96
CENTER 50	FE
STAT 50	FE
DYNA 50	9F

(continued)

## 2H MODEL PROCEDURES

### DP-17 Procedures

#### DCU Pattern Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **HELP** button on remote. Magic Focus Pattern Mode will now be displayed.
5. Press the **6** button to rotate the arrow. (Arrow indicates each sensor position)
6. Press the buttons shown below to switch colors.

**STATUS** = Green

**0** = Red

**ANT** = Blue

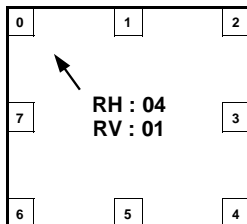
7. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
8. Press ▲ or ▼ button to scroll vertically (RH, ▼, RV, for example).
9. Press **PIP MODE** button twice to write the data to the EEPROM.
10. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

(continued)

# 2H MODEL PROCEDURES

## DP-17 Procedures

### DCU Pattern Set-up Table



DP-17 Chassis: Normal Mode								
	0	1	2	3	4	5	6	7
RH	04	02	FE	00	FE	02	04	02
RV	01	00	03	01	FE	02	00	00
GH	04	00	FE	00	FE	00	04	02
GV	01	00	02	01	FF	02	00	01
BH	04	FE	FE	00	FE	FE	04	02
BV	02	00	01	01	FF	02	FF	01



## 2H MODEL PROCEDURES

### DP-23/23G/23K/24 Procedures

The DP-23/23G/23K/24 has only one deflection mode however, there are two adjustments which must be properly adjusted *before* starting the convergence correction adjustments; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST.

#### DCU PHASE ADJUST

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **CBL/SAT, [VID2]** button on remote. (Green crosshatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown below by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown below by using the **2** and **5** button on the remote.
7. Set CR-H phase data as shown below by using the **◀** and **▶** button on the remote.
8. Set CR-V phase data as shown below by using the **▲** and **▼** button on the remote.
9. Press **CBL/SAT, VID2** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

#### PHASE MODE

PH-H: CD

PH-V: 04

CR-H: 35

CR-V: 0A

(continued)

## 2H MODEL PROCEDURES

### DP-23/23G/23K/24 Procedures

#### HORIZONTAL POSITION ADJUST

1. Input an NTSC crosshair signal.
2. Press the Service switch to change to internal DCU crosshatch.
3. Mark the center of the DCU crosshatch with your finger.
4. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSITION.
5. Adjust the data so that the center of NTSC crosshair matches the location found in step 3 above.
6. Press the **MENU** button to exit from the Service Menu.

#### Service Menu access and how to view/change the I<sup>2</sup>C Data values:

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

(PAGE 01)	
ADJUST MODE	
SERVICE	<input type="checkbox"/>
SUB BRT	<input type="checkbox"/>
WHITE BAL	<input type="checkbox"/>
R DRV (COOL)	3F
B DRV (COOL)	3F
R CUTOFF (COOL)	80
G CUTOFF (COOL)	80
B CUTOFF (COOL)	80
<b>H POSITION</b>	<b>3F</b>
V POSITION	3F
FACT RESET	<input type="checkbox"/>

*Note: Value shown may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.

*(continued)*

## 2H MODEL PROCEDURES

### DP-23/23G/23K/24 Procedures

There are two additional adjustments which must be performed when replacing a DCU. These are called **DCU Character Set-up**, and **DCU Pattern Set-up**. These adjustments must be performed prior to making convergence corrections.

#### DCU Character Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **PIP CH** button on remote. ADJ PARAMETER mode will now be displayed.
5. Press ▲ or ▼ button to scroll through the table.
6. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
7. Press **PIP MODE** button twice to write the data to the EEPROM.
8. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

ADJ. PARAMETER ROM WRITE?		
➔	ADJ. DISP	77
	DEMO WAIT	2F
	INT. START	03
	V. SQUEEZE	F0

(continued)

# 2H MODEL PROCEDURES

## DP-23/23G/23K/24 Procedures

### DCU Character Set-up Tables

	DP23/23G	DP23K/DP24
Parameter	Normal	Normal
ADJ.DISP	77	77
DEMO WAIT	2F	2F
INT. START	03	03
V. SQUEEZE	F0	F0
INT STEP 1	02	02
INT STEP 2	06	06
INT BAR	28	25
INT DELAY	01	01
MGF STEP 1	00	00
MGF STEP 2	06	06
MGF BAR	1B	1B
MGF DELAY	01	01
SEL. STAT	00	00
LINE WID	1F	1F
ADD LINE	09	09
SENSOR CK	00	00
PORT 0	07	07
PORT 1	06	06
PORT 2	05	05
PORT 3	04	04
PORT 4	03	03
PORT 5	02	02
PORT 6	01	01
PORT 7	00	00
AD LEVEL	03	03
CENT BAL	00	01
E. DISPLAY	00	00
E. ADJ. TIMS	60	60
E. AD LEVEL	05	05
E. AD NOISE	0A	0A
PHASE MOT	60	60
H. BLK-RV	00	00
H. BLK-GV	01	01
H. BLK-BV	00	00
H. BLK-H	00	00
PON DELAY	0C	0C
IR-CODE	00	00
INITIAL 50	9E	9E
MGF 50	96	96
CENTER 50	FE	FE
STAT 50	FE	FE
DYNA 50	9F	9F

(continued)

## 2H MODEL PROCEDURES

### DP-23/23G/23K/24 Procedures

#### DCU Pattern Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **CBL/SAT, VID2** button on remote. Magic Focus Pattern Mode will now be displayed.
5. Press the **6** button to rotate the arrow. (Arrow indicates each sensor position)
6. Press the buttons shown below to switch colors.

**INFO** = Green

**0** = Red

**ANT** = Blue

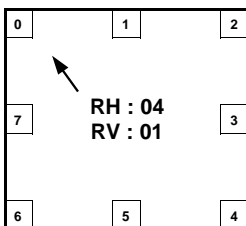
7. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
8. Press ▲ or ▼ button to scroll vertically (RH, ▼, RV, for example).
9. Press **PIP MODE** button twice to write the data to the EEPROM.
10. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

(continued)

# 2H MODEL PROCEDURES

## DP-23/23G/23K/24 Procedures

### DCU Pattern Set-up Tables



DP-23/23G Chassis: Normal Mode								
	0	1	2	3	4	5	6	7
RH	04	02	FC	FE	FC	02	02	02
RV	03	00	07	01	FB	01	FE	01
GH	04	00	FE	00	FE	00	02	02
GV	04	00	06	01	FC	01	FE	01
BH	06	FE	FC	00	FE	FE	04	02
BV	06	00	04	01	FE	01	FB	01

DP-23K Chassis: Normal Mode								
	0	1	2	3	4	5	6	7
RH	04	02	FE	00	FE	02	04	02
RV	03	01	06	01	FC	01	FF	01
GH	04	00	FE	00	FE	00	04	02
GV	04	01	05	01	FD	01	FD	01
BH	04	FE	FE	02	00	FE	04	02
BV	06	01	04	01	FF	01	FD	01

DP-24 Chassis: Normal Mode								
	0	1	2	3	4	5	6	7
RH	04	02	FE	00	FE	02	04	02
RV	03	01	06	01	FC	01	FF	01
GH	04	00	FE	00	FE	00	02	02
GV	04	01	05	01	FD	01	FD	01
BH	04	FE	FE	02	00	FE	04	02
BV	06	01	04	01	FF	01	FD	01

## 2H MODEL PROCEDURES

### DP-26/27/27D Procedures

The DP-26/27/27D has only one deflection mode however, there are two adjustments which must be properly adjusted *before* starting the convergence correction adjustments; they are DCU PHASE ADJUST and HORIZONTAL POSITION ADJUST.

### DCU PHASE ADJUST

1. Input an NTSC signal via tuner, composite video, or S-video.
2. Press the Service switch.
3. Press **AV NET** button on remote. (Green cross-hatch is displayed)
4. Press **EXIT** button on remote. (Character pattern is displayed, which is the DCU Phase setting mode)
5. Set PH-H phase data as shown below by using the **4** and **6** button on the remote.
6. Set PH-V phase data as shown below by using the **2** and **5** button on the remote.
7. Set CR-H phase data as shown below by using the ◀ and ▶ button on the remote.
8. Set CR-V phase data as shown below by using the ▲ and ▼ button on the remote.
9. Press **AV NET** button on remote to exit from PHASE ADJUST Mode.
10. Press **PIP MODE** button on remote twice to write the new Phase data to memory.
11. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

#### PHASE MODE

PH-H: CD

PH-V: 04

CR-H: 35

CR-V: 0A

(continued)

## 2H MODEL PROCEDURES

### DP-26/27/27D Procedures

#### HORIZONTAL POSITION ADJUST

1. Input an NTSC crosshair signal.
2. Press the Service switch to change to internal DCU crosshatch.
3. Mark the center of the DCU crosshatch with your finger.
4. Enter the I<sup>2</sup>C Bus alignment menu and select Item H POSITION.
5. Adjust the data so that the center of NTSC crosshair matches the location found in step 3 above.
6. Press the **MENU** button to exit from the Service Menu.

#### Service Menu access and how to view/change the I<sup>2</sup>C Data values:

- The Set should be OFF
- Press and hold the **INPUT** button on the front panel.
- Then press the **POWER** button.
- Release both buttons.
- The Service Menu (I<sup>2</sup>C) should appear on the screen.
- To scroll through the Menu use the ▲ and ▼ buttons.
- To jump through the Service Menu page by page, press the **MENU** button on Remote.
- To Adjust Data Values, use the ◀ and ▶ buttons.

(PAGE 01)	
ADJUST MODE	
SERVICE	<input type="checkbox"/>
SUB BRT	<input type="checkbox"/>
WHITE BAL	<input type="checkbox"/>
R DRV (COOL)	3F
B DRV (COOL)	3F
R CUTOFF (COOL)	80
G CUTOFF (COOL)	80
B CUTOFF (COOL)	80
<b>H POSITION</b>	<b>3F</b>
V POSITION	3F
FACT RESET	<input type="checkbox"/>

*Note: Value shown may or may not be typical*

After making DCU Phase Adjustment and Horizontal Position Adjustment, proceed with convergence correction adjustments.



## 2H MODEL PROCEDURES

### DP-26/27/27D Procedures

There are two additional adjustments which must be performed when replacing a DCU. These are called **DCU Character Set-up**, and **DCU Pattern Set-up**. These adjustments must be performed prior to making convergence corrections.

#### DCU Character Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **PIP CH** button on remote. ADJ PARAMETER mode will now be displayed.
5. Press ▲ or ▼ button to scroll through the table.
6. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
7. Press **PIP MODE** button twice to write the data to the EEPROM.
8. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

ADJ. PARAMETER ROM WRITE?		
➔	ADJ. DISP	77
	DEMO WAIT	2F
	INT. START	03
	V. SQUEEZE	F0

(continued)

# 2H MODEL PROCEDURES

## DP-26/27/27D Procedures

### DCU Character Set-up Table

	DP26/27/27D
Parameter	Normal
ADJ.DISP	77
DEMO WAIT	2F
INT. START	03
V. SQUEEZE	F0
INT STEP 1	02
INT STEP 2	06
INT BAR	28
INT DELAY	01
MGF STEP 1	00
MGF STEP 2	06
MGF BAR	1B
MGF DELAY	01
SEL. STAT	00
LINE WID	1F
ADD LINE	09
SENSOR CK	00
PORT 0	07
PORT 1	06
PORT 2	05
PORT 3	04
PORT 4	03
PORT 5	02
PORT 6	01
PORT 7	00
AD LEVEL	03
CENT BAL	00
E. DISPLAY	00
ADJ. TIMS	60
AD LEVEL	05
AD NOISE	0A
PHASE MOT	60
H. BLK-RV	00
H. BLK-GV	01
H. BLK-BV	00
H. BLK-H	00
PON DELAY	0C
IR-CODE	00
INITIAL 50	9E
MGF 50	96
CENTER 50	FE
STAT 50	FE
DYNA 50	9F

(continued)

## 2H MODEL PROCEDURES

### DP-26/27/27D Procedures

#### DCU Pattern Set-up

1. Connect NTSC signal.
2. Clear RAM. (*page 74*)
3. Press **FREEZE** button on remote. (two additional horizontal lines will appear)
4. Press **AV NET** button on remote. Magic Focus Pattern Mode will now be displayed.
5. Press the **6** button to rotate the arrow. (Arrow indicates each sensor position)
6. Press the buttons shown below to switch colors.

**INFO** = Green

**0** = Red

**ANT** = Blue

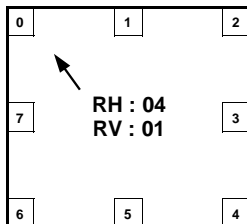
7. Press ◀ or ▶ button to change the data so that it corresponds to the table shown below.
8. Press ▲ or ▼ button to scroll vertically (RH, ▼, RV, for example).
9. Press **PIP MODE** button twice to write the data to the EEPROM.
10. When Green dots appear, press **MUTE** button on remote to return to DCU adjustment mode.

(continued)

# 2H MODEL PROCEDURES

## DP-26/27/27D Procedures

### DCU Pattern Set-up Table



DP-26/27/27D Chassis: Normal Mode								
	0	1	2	3	4	5	6	7
RH	04	02	FC	FE	FC	02	02	02
RV	03	00	07	01	FB	01	FE	01
GH	04	00	FE	00	FE	00	02	02
GV	04	00	06	01	FC	01	FE	01
BH	06	FE	FC	00	FE	FE	04	02
BV	06	00	04	01	FE	01	FB	01

2H MODEL  
PROCEDURES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.